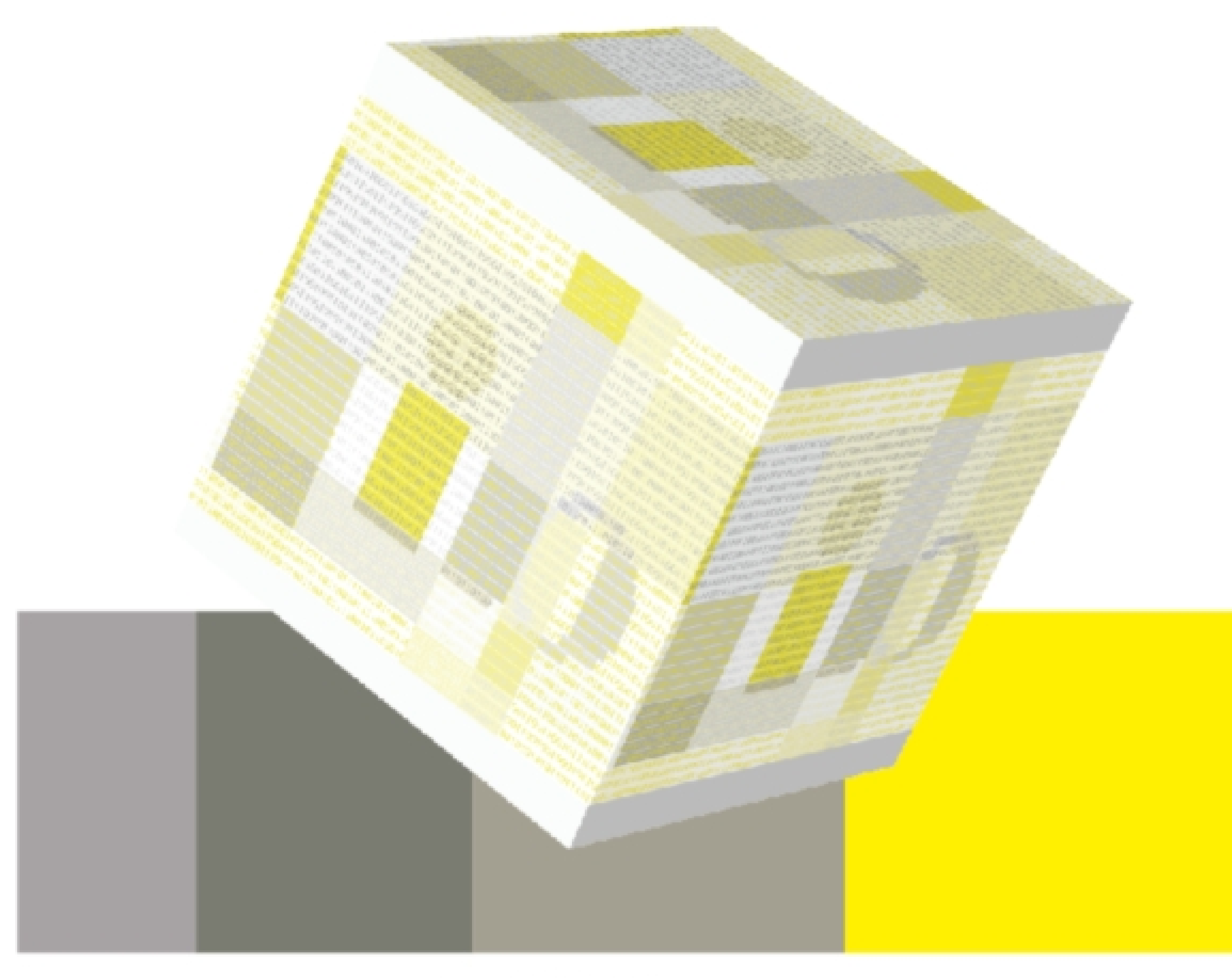
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教育資料與圖書館學

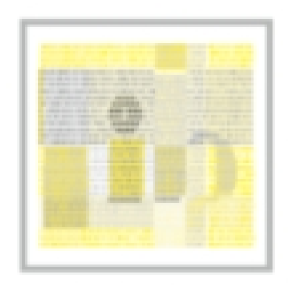
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教育資料與圖書館學 JOURNAL OF EDUCATIONAL MEDIA & LIBRARY SCIENCES Vol. 52, No. 1, 2015



淡江大學出版中心



教育資料與圖書館學，始於1970年3月創刊之**教育資料科學月刊**，其間於1980年9月更名為**教育資料科學**，改以季刊發行。自1982年9月起易今名，而仍為季刊，每年冬(1月)、春(4月)、夏(7月)與秋季(10月)各出刊一期，合為一卷。現由淡江大學出版中心出版，淡江大學資訊與圖書館學系和覺生紀念圖書館合作策劃編輯。本刊為國際學術期刊，2008年獲國科會學術期刊評比為第一級，並廣為海內外知名資料庫所收錄(如下英文所列)。

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教育資料與圖書館學
JOURNAL OF EDUCATIONAL MEDIA & LIBRARY SCIENCES

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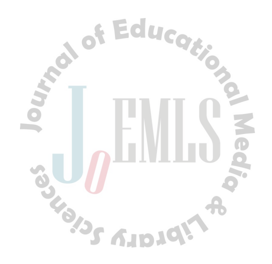
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教育資料與圖書館學

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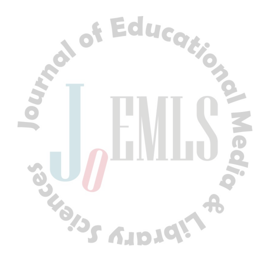
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EDITORIAL

In and Beyond This Issue

The first issue of Volume 52 of *Journal of Educational Media and Library Sciences* (JoEMLS) is published in January 2015, starting a new set of issues in the same volume, with four issues to be published in the same year in the future as Winter Issue (January), Spring Issue (April), Summer Issue (July), and Autumn Issue (October).

For this issue, ten manuscripts were received and four were accepted, with a rejection rate of 60%. Seven manuscripts are still at the review stage by our publication date. In this issue, three research articles are published, including “A Content Analysis of Internet Health Rumors” by Lo and Chiu, “Integrating considerations of students, teachers, and instructional contexts in a predictive model of distance education” by Yueh and Liang, and “Exploring Mathematics Teachers’ Perception of Technological Pedagogical Content Knowledge” by Lai and Lin. These three research articles are based on both practices and theories, providing precious information and reflections for readers, especially practitioners. In the Brief Communication section of this issue we also publish the article “The Mongolian Publishing Culture under Enlightenment Thought, 1918-1944” by Yeru Bai and Aotegen Bai, scholars from Mongolian Studies College of Inner Mongolia University, for us to further understand the development history of publishing business in contemporary China, and for scholars who study the history of Chinese publishing to do further research.

Readers might notice that in this issue, the Romanized notes in works cited are different from the previous editorial presentation. First, for the running numbered notes of Turabian referencing style, we place the footnote numbers after punctuations, for easier reading. Second, for the Romanized citations of Chinese cited works, we changed the previous fragmented Romanized characters after each Chinese phrase or term, and adopted a new way of placing all Romanized whole item of each citation including titles, issue information and author names together, without showing any Chinese characters. We only place “in Chinese” in the end of citations of works written in Chinese, to distinguish them from citations of works in foreign languages. The main purpose of this modification is to facilitate the citation indexing of international journal databases. We hope in the future when our Chinese manuscripts are indexed in internationally famous citation index databases, such as Scopus or SSCI, the Romanized titles of cited Chinese works can be shown as well. In this way we can honor each contribution of manuscript authors, as well as those cited authors, and achieve the goals of international scholarly communications. This is our new hope for the Goat Year 2015.

Jeong-Yeou Chiu
JoEMLS Chief Editor

教育資料與圖書館學　52 : 1 (2015) : 1-2
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編者言

本期紀要與展望

教育資料與圖書館學 季刊52卷1期始於2015年元月，開啟了新的季刊刊期順序，此後將分別為同年度的一月（冬季號）、四月（春季號）、七月（夏季號）和十月（秋季號）。本卷期共計處理10篇稿件，收錄其中4篇文章，使得退稿率降為60%，而截至出刊前仍有7篇論文處於評閱作業流程之中。在此一卷期裡，我們刊載了三篇研究論文，分別為：羅文伶與邱銘心對於「網路健康謠言內容分析研究」、岳修平與梁朝雲論述「綜整學生、教師與教學情境考量的遠距教學預測模型」、賴婷鈴與林曉芳針對「國中數學教師科技學科知識之探究」（原文為英文）等。這些文章都是深具實務應用價值與嚴謹理論架構的作品，相信會給許多讀者，尤其是實務工作者，提供寶貴的資訊與反思。本卷期我們也特別於短文論述（Brief Communication）中，刊出了內蒙古大學蒙古學學院學者白葉茹與白敖特根教授的「啟蒙思潮下的蒙古族出版文化：1918年至1944年」，足以讓我們更加了解近代中國出版業發展的歷史面貌，有助於有興趣之學者對中國出版史的後續研究工作。

細心或有經驗的讀者或許將發現此一卷期之內文註釋（notes）、文後的中文羅馬化引文格式，跟過去的編輯呈現方式有著明顯差異。首先在以芝加哥(Turabian)格式為主的連續編碼註釋實例裡，我們一律將內文裡各個註釋編碼置於標點符號之後，使閱讀視覺上，更為順暢自然。其次我們於各篇稿件後之每一筆羅馬化引文的編排上，取消先前的分段羅馬化做法，改採整筆不分段且不出現中文的羅馬化作法，省略了原有的中文字欄位，僅於該筆資料最後加註「（in Chinese）」字樣，以便與外文引用文獻相互區隔。這種改變的主要目的在於「為加速國外期刊資料庫進行引文索引建檔之需求」。[1] 期待在未來本刊所有的中文稿件在被收錄於國際知名的引文索引資料庫時，例如：Scopus或SSCI，都能被這些引文索引資料庫完整地呈現稿件作者所引用的每筆羅馬化後的中文引用文獻；如此才足以尊重本刊作者與被引用文獻作者的每一項貢獻，並真正落實跨國學術傳播的真諦。這是我們的2015年羊年新希望。

邱　炯友
教育資料與圖書館學 主編

[1] 相關資料與建議參考：邱炯友與林瑺慧。學術期刊羅馬化：*APA*、*Chicago (Turabian)*與羅馬化引文格式規範。新北市：淡江大學出版社，2014年。

教育資料與圖書館學　52 : 1 (2015) : 3-31
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研究論文

網路健康謠言內容分析研究

羅文伶[a]　邱銘心[b*]

摘要

本研究採用內容分析法，以在網路上所散佈的健康謠言為標的。從「網路追追追」網站蒐集295筆網路健康謠言作為分析樣本，探討其內容特徵與表現方式、各主題健康謠言內容型態，以及查證屬實為健康資訊與健康謠言的差異。研究發現，網路健康謠言常見主題為保健與預防資訊，多數描述一特定行為或食品/用品，沒有精確日期及地點；最常採用專業說法及親身體驗為佐證，主要目的為注意/警惕、分享新知；三成採用第一人稱描述；半數謠言的主要訊息源於親友、醫師說法，及本人經驗。最常採用敘事、新聞報導的形式進行敘述，對收訊者而言感受上較親切且易讀。查證屬實的健康資訊與錯誤訊息，兩者亦差異不大。本研究的發現期能作為民眾接收到相關健康資訊時的初步判斷依據，以及相關單位進行衛教活動、講座活動之參考，最終期能提升民眾的健康素養。

關鍵詞：消費者健康資訊，謠言，健康謠言，內容分析

緒　　論

健康與保健向來是多數人相當關心的議題。Gann（1995）曾說：「消費者健康資訊毫無疑問地，一直是過去十年間在資訊界的重要趨勢。」美國的Pew網路與美國生活計畫（Pew Internet and American Life Project）在其研究報告“Health Online 2013”中指出，過去一年間全美約有81%的上網人口，其中有59%的民眾曾透過網路搜尋健康資訊；35%的成人表示曾特地上網搜尋相關資料，以判斷自身或他人的健康狀況或症狀（Fox & Duggan, 2013）。根據行政院研究發展考核委員會於2011年所公布「個人/家戶數位機會調查報告」，健康資訊是受訪民眾最常搜尋的資料類型排名第12名，2012年及2013年約有52.3%及62%的受訪民眾於過去一年曾在網路上尋求衛教知識（行政院研究發展考核委員會〔研考會〕，2011，2012，2013）。由國內外相關調查報告可知，網路已成為民眾獲取健康資訊的重要途徑之一。

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民眾的健康意識日漸提升，網路上則充斥著各類健康資訊以滿足民眾需求，卻因守門機制的缺乏，導致許多未經查證的訊息或謠言充斥於網路中，然而網路的匿名性與高即時性等特性，卻非常利於謠言的傳播（汪志堅、駱少康，2002）。根據過去研究發現，多數謠言屬於「衛生/健康」、「消費安全性」等與訊息接收者日常生活息息相關的訊息（汪志堅、駱少康，2002），若民眾誤信未經證實的資訊或謠言，可能導致錯誤決策，甚至因而延誤就醫而錯失治療良機，最終影響健康及生命安全。過去許多有關謠言的研究皆指出，當發生重要且與自身相關的事件，民眾所掌握的細節卻不夠清楚，又缺乏官方認證時，就很容易產生謠言與傳播（Allport & Postman, 1947; Knapp, 1944; Shibutani, 1966）。2013年台灣爆發多起食安問題，導致人心惶惶，與生活切身相關的議題吸引了社會大眾的關注。此時網路上即出現不少相關謠言，如「醫衛部公布之第二波有毒食品名單」，或「2013年國家質監局公佈女生禁用化妝品清單」等，後經查證都屬於輾轉從大陸跨海傳播來台的健康謠言。除了謠言，亦有不少未經證實、缺乏確切證據的相關健康資訊大量在網路上散播，不僅會造成個人健康的負面影響，也可能造成社會恐慌（張珈瑄，2013）。

本研究以網路健康謠言為研究標的，意指在網路上散佈的健康謠言，並參考汪志堅與駱少康（2002）對謠言進行內容分析的架構及蘇諼（2001）所定義的消費者健康資訊範圍，針對從「網路追追追」網站所收集的295則網路健康謠言進行文本分析，探討其特徵、各主題謠言的內容型態，及查證屬實為健康資訊與謠言的差異為何。本研究提出的研究問題包括：㈠網路健康謠言之內容特徵為何？㈡網路健康謠言之表現方式為何？㈢不同主題之網路健康謠言的內容特徵及表現方式為何？㈣查證屬實之網路健康資訊與網路健康謠言之內容特徵及表現方式為何？希望透過網路健康謠言的內容分析，對此能有更進一步的認識，以期提供民眾接收到相關健康資訊時，能作為其初步判斷的參考；並期望能提供相關單位，如各地方衛生所、醫院衛教單位，或公共圖書館等，在進行衛教活動、講座時的參考，提升民眾的健康素養。

二、文獻探討

本研究共有三個核心議題：消費者健康資訊屬於本研究的資訊主題、網路謠言為研究所關心的訊息類型，而健康素養則是本研究希冀拓展的應用層面，文獻探討則就此三個核心議題進行文獻回顧與剖析。

㈠消費者健康資訊

「健康與保健」向來是民眾相當關心的議題。美國醫學圖書館協會設立之「消費者與病患健康資訊部門」Consumer and Patient Health Information Section of Medical Library Association（1996）對「消費者健康資訊」的定義主要從資訊提供

者及使用者需求的角度出發，「基於包含病患及其家屬之一般大眾的需求，所提供其有關健康、藥物等議題之資訊；除了症狀、病情診斷及治療方式等資訊外，還包括促進健康、預防醫學、健康決策及醫療保健系統的使用等資訊。」Patrick 與 Koss（1995）發表的「消費者健康資訊白皮書」（Consumer Health Information White Paper），其中指出消費者健康資訊為「提供給個人及其家屬，以掌握本身的健康狀況及決定健康的相關決策之資訊」（轉引自張慧銖，2004）。

關於消費者健康資訊所涵蓋之範圍，蘇諼（2001）認為大致可分為五大類：

1. 疾病與藥物資訊，如疾病的症狀、診斷、治療、癒後處理與藥物資訊；
2. 適應資訊，如治療方法的過程、藥物使用、疼痛控制及居家照護；
3. 健康照護與醫學倫理，如醫師的資歷、醫院與醫師的評估、療養院的選擇、健康照護的支付問題；
4. 保健與預防資訊；
5. 身體功能資訊，如解剖學、生理學、性教育、懷孕與老化資訊等。

隨著科技的發展，有越來越多使用者透過網際網路搜尋健康資訊。過往民眾嘗試在家自行找出自身的健康問題，並決定是否要接受醫療服務，以及接受醫療服務的時機。現在許多民眾將網路列為進行相關判斷時的重要工具之一，協助自身及其所關愛的人了解造成其不適的原因；也可以說，網路已成為重要的診斷工具（Fox & Duggan, 2013）。根據國內外調查，越來越多民眾習於透過網路取用健康資訊（研考會，2011，2012，2013；Fox & Duggan, 2013），網路可以突破時間與空間的限制，提供客製化的健康資訊，並且保有匿名性（Cline & Haymes, 2001），但由於缺乏守門機制，使網路上的健康資訊參差不齊，錯誤的醫學資訊可能導致病情延誤、用藥錯誤甚至喪失生命（邱永仁，2005）。

㈡ 網路謠言

當一則與時事相關之訊息，只要該訊息有足以使人信服的理由，即便該則訊息並未經官方證實、澄清，仍會廣為流傳，此時此訊息即可稱為「謠言」（Kapferer, 1990; Knapp, 1944）。此處所指「官方」指的是被謠言所指涉的當事人，包括政府、廠商，或任何個體或組織等當事人的澄清，或由客觀公正之第三者來出面澄清說明，都可稱之為官方證實（汪志堅、駱少康，2002）。在謠言的傳播過程中，人們對於不清楚、模糊的細節通常會加上根據「間接證據」的推斷、修飾，而這些修飾通常能反映出人們對外界事物的假想或猜測（Bordia & Rownow, 1998）。

由於謠言多來自於未經證實的溝通，可說是「眾說紛紜」的結果。一般人通常將「謠言」與「錯誤訊息」連結在一起，對謠言多抱持負面的印象。但根據各學者對謠言的定義，並未直接將謠言定義為「錯誤、負面的訊息」，甚至仍有謠言最後被證實為真。綜而言之，謠言是大眾溝通活動之一，其通常是未經

證實的訊息，缺乏直接、正規的證據，卻因其訊息對收訊者有一定的重要性，因此能被接受且廣為流傳（Kapferer, 1990; Knapp, 1944; Rownow & Fine, 1976; Shibutani, 1966）。根據Knapp（1944）的研究，謠言的特徵包括是透過口語傳播、提供關於人、事件，與情境的「資訊」、滿足一個社群的情感需求；而其組成要素包含下列三項：

1. 目標：意指謠言所指涉的人、事、時、地、物。
2. 對目標的陳述或主張：意指謠言的目的為何。
3. 謠言訊息來源：意指發訊者從何來源獲悉謠言。

過往的謠言主要透過人際溝通進行傳播，但網際網路的普及，改變了人類傳統的溝通方式（汪志堅、駱少康，2002）。由於網路具有匿名性、複製性、訊息查證的間接性和延遲性，以及網路訊息的似真實性，因此有利於謠言的傳播（楊達妮，2002）。網路謠言和傳統謠言無論在分類、特性或傳播動機等方面基本上一致，然而傳統的口頭傳播型態並不利於謠言文本的累積，此類管道通常僅存於人們的記憶，網路謠言最大的優勢在於其傳播方式，透過其三大特性：全球性、及時性、從不結束，不斷地傳遞謠言（許文怡、梁朝雲，2007）。

㈢ 健康素養

健康素養譯自health literacy，亦有人翻作「健康知能」或「健康識能」。Ad Hoc Committee on Health Literacy for the Council on Scientific Affairs, American Medical Association（1999）將健康素養定義為「能進行基本閱讀及資訊任務，以因應在健康照護環境中相關工作的進行之一組能力」。美國全國衛生教育標準聯合委員會Joint Committee on National Health Education Standards（1995）也指出健康素養是「一種能力，使個體能獲取、解釋並了解基本的健康資訊及服務，並且能夠利用這些資訊及服務促進健康」。由上述定義可看出，健康素養不只是「功能性」的能力，而是提升到「批判性」的能力（劉婉柔，2013）。

Nutbeam（2000）將健康素養分為三個層次。第一層次的基本／功能性健康素養，係具有足夠的讀寫能力，在日常生活情境中能有效發揮功效。第二層次的溝通／互動性健康素養，則是更進階的認知、素養以及社會能力，可以於日常生活中發揮作用，能從不同的溝通管道萃取資訊並了解其含意，以應用所獲取的新資訊改變環境。第三層次的批判性健康素養則是更進一步的認知技能及社會技能，個人能用批判性思考進行資訊的分析，並且能運用此能力更有效的處理生活事件及狀況；此層次的技能為健康的自我管理所最必須的核心技能，有助於個人針對自身健康管理、健康資訊，及健康照護服務進行批判性決策。

過往研究即指出，病患對於症狀的誤解，或相關的傳聞會影響其治療意願以及相關決策之訂定（Matthews, Sellergren, Manredi, & Williams, 2002）。另一份針對169名網路癌症討論小組成員所進行的問卷調查，發現超過六成的研究參

與者相信癌症謠言或未經證實的癌症資訊，尤其當這些資訊來自於親朋好友，多數受試者傾向相信這些資訊，即便這些資訊並沒有醫學根據，甚至根本就是謠言（DiFonzoa, Robinson, Sulsc, & Rinid, 2012）。因此使用者需要能評斷、批判所收到的健康資訊，也就是要具備一定的健康素養，並且將此應用於改善其健康狀況。

總結文獻探討的三個核心概念，網路健康謠言雖不一定是「錯誤」訊息，但多數「未經證實」，且在書寫時多半會加以佐證，使謠言本身可以「自我合理化」（汪志堅、駱少康，2002），讓收到這些網路健康謠言的民眾會因其「看起來很合理」而誤以為真；再加上所傳遞之資訊為社會大眾相當關注、與日常生活極為相關的「消費者健康資訊」，使民眾認定該資訊是「重要的」，而將此類資訊再透過網路分享給親朋好友，從而使得健康謠言容易被接受並不斷被快速傳播。若民眾能具備一定的健康素養，並能確實掌握核心的批判性素養能力，不僅能有效獲取、解釋並了解基本的健康資訊及服務，更能對所接收到的健康資訊及謠言進行批判，且能應用健康資訊內容品質評估的工具、指標，評估所獲取之資訊真偽、品質如何，有助於其取得正確、有品質的健康資訊，以促進其個體健康；此外，若民眾的健康素養獲得提升，對於網路流傳或口耳相傳的謠言，才能扮演「智者」的角色，批判並停止謠言的繼續傳播。

三、研究方法與實施

㈠研究方法－內容分析法

為探討網路健康謠言內容特徵，本研究採用內容分析法進行分析。內容分析是一種將文件內容量化的過程；透過分析文件中的某些屬性，予以計算、統計、推論、解釋，以探尋文件內容背後真正的意圖，即以內容「量」的變化來推論「質」（吳紹群，2002），屬於一種質化與量化兼具的研究方法。由於健康謠言的文本充斥於網路環境中，取得容易，透過內容分析法，得以最直接地了解謠言被產製後的特徵與型態。

本研究的資料蒐集與分析採用Krippendorff（1980）針對內容分析提出之六大問題來完成，並依序確認研究步驟、建立分析框架，以及檢視分析流程。其所提出的六大問題分別為：1.決定資料分析對象；2.如何定義；3.確認抽樣的母體及樣本；4.發掘與分析資料相關的情境脈絡；5.界定分析的範圍；與6.確定推論的目標。內容分析法使用的研究工具為編碼表，每份表單都設有記錄序號以及每個變項資料的欄位，以便登錄分析結果（Neuman, 2000/2002）。關於研究的執行步驟與編碼表的建立，詳述於分析框架與資料收集與分析兩節。

㈡分析框架

本研究主要分析框架係根據汪志堅與駱少康(2002)之研究，並依本研究之目的、研究問題，及前導研究結果而調整最終的分析項目。本研究主題網路健康謠言特徵細分為「內容特徵」及「表現方式」兩大項目；結合蘇諼(2001)對消費者健康資訊的分類，以及汪志堅與駱少康(2002)延伸自Koenig(1985)所提出謠言組成要素所發展出的架構加以調整後，將網路健康謠言特徵延伸發展為六項觀察項目：查證結果、謠言主題、指涉目標、謠言佐證證據、謠言主張，以及謠言呈現方式。其詳細編碼項目說明如網路健康謠言內容分析項目說明(表1)。

表1　網路健康謠言內容分析項目說明

觀察項目		編碼項目	說　　明	觀察項目參考來源
查證結果		調查報告之查證結果	[開放性編碼] 根據謠言對應之調查報告，記錄其查證結果	為本研究新增分析要素
謠言主題	謠言主題分類	疾病與藥物資訊	分析謠言主題是否屬此類型，是者編碼1，否者編碼0	為本研究新增的分析要素，根據蘇諼(2001)對消費者健康資訊的範圍而定
		適應資訊	同上	
		健康照護與醫學倫理	同上	
		保健與預防資訊	同上	
		身體功能資訊	同上	
		其他	[開放性編碼]記錄不同於上述類型之內容	
指涉目標	謠言所述對象	特定公司/團體	分析謠言內容有否明確指出特定公司或團體，有指出者編碼1，未指出者編碼0	據汪志堅與駱少康(2002)研究架構而定，更改「某一普遍存在事件」並增加「其他」
		特定個人	同上	
		某一普遍存在事件	同上	
		某種食品/用品	同上	
		某一特定行為	同上	
		其他	[開放性編碼] 記錄不同於上述類型之內容	
	內容發生時間	明確日期	分析謠言內容有否明確說明事件發生的日期，有者編碼1，無者編碼0	據汪志堅與駱少康(2002)研究架構而定，將項目名稱調整為「明確日期」、「模糊日期」及「持續發生」
		模糊日期	同上	
		持續發生	同上	
	內容發生地點	精確地點	分析謠言內容有否明確說明事件發生的地點，有者編碼1，無者編碼0	據汪志堅與駱少康(2002)研究架構而定，將項目名稱調整為「精確地點」、「模糊地點」及「無地點」
		模糊地點	同上	
		無地點	同上	
謠言佐證證據	提高可信度的證據	照片/圖示/影片	分析謠言內容有否附上照片或圖示、影片，有則給予編碼1，無則給予編碼0	據汪志堅與駱少康(2002)研究架構而定，調整項目名稱為「照片/圖示/影片」、「專家/專門團體說法/研究報告說法」、「專有名詞」、「親友親身經驗」、「本人親身經驗」、「其他親身經驗案例」「聯絡方式/查證管道」
		專家/專門團體說法/研究報告說法	主要分析內容有否附上專家或專門團體、研究報告說法的說法，編碼原則同上	
		專有名詞	主要分析內容有否附上專有名詞，編碼原則同上	

		親友親身經驗	主要分析內容有否附上親友親身經驗，編碼原則同上	
		本人親身經驗	主要分析內容有否附上發訊者親身經驗，編碼原則同上	
		其他親身經驗案例	主要分析內容有否其他人或某名人等之親身經驗，編碼原則同上	
		聯絡方式/查證管道	主要分析內容有否附上相關人士聯絡方式或可供查證內容的說法，編碼原則同上	
謠言主張	內容的主張及訴求	抵制	分析謠言的主張或訴求是否屬此類型，是者編碼1，否者編碼0	根據汪志堅與駱少康（2002）之研究架構而定，將「拒絕消費/抵制」調整為「抵制」、「建議進行動作」，增加「其他」
		注意/警惕	同上	
		求助	同上	
		進行動作	同上	
		分享新知	同上	
		其他	[開放性編碼] 記錄不同於上述類型之內容	
謠言表現方式	謠言字數	字數	統計單則謠言內容總字數	為本研究新增之分析要素
	敘述人稱	敘述人稱	[開放性編碼] 記錄謠言敘述人稱為本人或他人	為本研究新增之分析要素
	託稱來源	訊息託稱來源	[開放性編碼] 記錄謠言訊息來源為何	為本研究新增之分析要素
	內容事件陳述方式	敘事型	分析謠言事件陳述方式是否屬此類型，是者編碼1，否者編碼0	為本研究新增之分析要素
		守則型	同上	
		推論型	同上	
		新聞報導型	同上	
		清單型	同上	
		未直接提供內容	同上	
		其他	[開放性編碼] 記錄不同於上述類型之內容	

資料來源：本研究整理

1. 查證結果：依據謠言的調查報告記載之查證結果，採用開放性編碼，查證結果分為查證屬實之健康資訊與健康謠言。
2. 謠言主題：此項目主要在分析網路健康謠言的主題為何，參考蘇諼（2001）提出的消費者健康資訊的範圍，分為五類：疾病與藥物資訊、適應資訊、健康照護與醫學倫理、保健與預防資訊、身體功能資訊。除上述五種特性外，另外增加「其他」一種，採用開放性編碼，以記錄觀察到的現象。
3. 指涉目標：此項目主要在分析網路健康謠言內容指涉目標，根據汪志堅與駱少康（2002）之架構，將此項目分為三部分：謠言所述對象、內容發生時間，以及內容發生地點。
4. 謠言佐證證據：此項目主要探討網路健康謠言為提高謠言可信度所附之證據。

5. 謠言主張：主要分析網路健康謠言欲傳達給收訊者的主張或訴求，根據汪志堅與駱少康（2002）的研究結果，謠言內容的主張可分為拒絕消費或抵制、注意/警惕、求助、進行動作、新聞性。本研究探討健康謠言是否也有類似的主張。除上述五種主張外，另外增加「其他」一種，採用開放性編碼，以記錄觀察到的額外現象。
6. 謠言表現方式：此項目主要在探討網路健康謠言常見的表現方式為何。此部分則分為謠言字數、敘述人稱、訊息託稱來源，及內容事件陳述方式。

整體來說，在本研究的分析框架，網路健康謠言「內容特徵」的觀察項目包括：謠言主題、指涉目標、謠言佐證證據及謠言主張四個項目，而網路健康謠言「表現方式」的觀察項目為謠言的呈現方式。同時依照「內容特徵」及「表現方式」的觀察項目分析不同主題的健康謠言；最後再依照查證結果，分別分析查證屬實之健康資訊與健康謠言的內容特徵及表現方式。

㈢資料收集與分析

1. 資料範疇

本研究分析資料來自「網路追追追」（http://rumor.nownews.com/）網站，其起源始於2000年東森新聞網站ETtoday.com所開闢之專門闢謠節目，起初主要是為電視節目需求而製作。網站主要任務即查證在網路上廣為流傳的轉寄信、文章、圖片和影音的來源、真實性、可信度，提供網友判斷依據。該網站所收錄的謠言大致分為尚未進行查證的「待查」謠言，及已經相關查證之「已查」謠言，兩者皆根據謠言內容分為下列類別，包括：消費、科技、社會、新奇、求助、詐騙、醫藥、靈異、名人、旅遊、傳奇、飲食、犯罪、影音、圖片、病毒、恐怖、健康、生物、美容及生活等。由於本研究著重於健康謠言分析，故將研究範圍限縮於「已查」謠言的「醫藥」及「健康」分類標簽下「已查」謠言。至2014/1/15止，醫藥標籤為已查謠言計有82則、健康標籤為已查謠言計有279則，其中有56筆謠言同時被註記「醫藥」及「健康」謠言，針對重複標籤謠言，經過審視內容之後，一律歸類為「健康」類。剔除內容與標籤不符、謠言內容已無法取得者，計有295筆謠言為本研究之資料分析來源。研究採用EXCEL試算表軟體進行資料登錄，依據「網站」對該則謠言的「登錄日期」先後進行排序。「健康」標籤之謠言以「H」為開頭進行編號，範圍為H001~H999，而「醫藥」標籤則採用「M」進行編號，編號範圍為M001~M999。其中，健康標籤謠言所有編號從H001~H273，醫藥標籤謠言所有編號從M001~M022。標示H123即代表標籤為「健康」類第123則已查謠言，而標示M003即代表標籤為「醫藥」類第3則已查謠言。

2. 資料分析

資料分析採三階段進行：第一階段針對所收集的謠言內容逐一進行編碼，分析各則謠言之查證結果、主題、指涉目標、佐證證據、主張，及表現方式。第二階段則根據六觀察項目，一一進行各編碼項目之量化描述統計分析，分析各觀察項目中編碼項目之百分比。第三階段根據前述分析結果進行論述與推論。

3. 信度檢核

研究信度需要至少有兩個編碼員，採用共同語言獨立進行編碼。這些共同語言包含了描述類目、變數數值及複雜的分類架構；內容分析信度基於兩種一致性：一為分析者一致性，另一為時間一致性（王石番，1989）。本研究採用分析者/編碼員間的信度分析，也就是在進行正式共同編碼前編碼員先進行前測與討論（Lacy & Riffe, 1996）。本研究隨機抽樣20筆謠言進行前測，共進行兩次的訓練、溝通及討論後，才進行正式編碼。本研究排除前測抽樣的樣本，透過隨機抽樣抽取全樣本的10%，共計30篇謠言為共同編碼的樣本數，一份編碼表的分析項目為41項，完成後再依雙方編碼結果一致與否計算出編碼員之間的相互同意度。相互同意度之計算方法，採用Holsti（1969）所提之公式檢驗信度，檢驗得出本研究編碼員間的相互同意度為0.846，超過Miles與Huberman（1984）提出的基本水準0.70，而信度為0.917。

㈣ 研究倫理

本研究之取樣方法為研究者直接至「網路追追追」網站下載網路謠言，並未徵詢使用者及站方的同意，然而「網站」上的言論、文章屬於公開發表之著作，本研究根據著作權法第五十二條：「為報導、評論、教學、研究或其他正當目的之必要，在合理範圍內，得引用已公開發表之著作。」作合理引用，因此本研究引用之網路謠言及調查報告並無侵害站方之著作權，若有論及某特定人士，且有涉及隱私，如罹患疾病等，本研究在結果分析及撰寫時，採匿名處理，且不會公開任何有可能指涉特定人士身份的資訊或細節。

四、研究發現

研究發現分為五個部分探討：網路健康謠言之內容特徵、表現方式，各主題健康謠言的內容型態、查證結果分析，以及綜合討論。

㈠ 網路健康謠言內容特徵

在謠言內容特徵的部分，細分為謠言主題、謠言指涉目標、謠言佐證證據及謠言主張等四個項目。

1. 謠言主題

本研究分析之健康謠言主題，依據蘇諼（2001）提出的消費者健康資訊範圍分為五大類：疾病與藥物資訊、適應資訊、健康照護與醫學倫理、保健與預防資訊、身體功能資訊。由於健康謠言內容涵蓋範圍多元，因此同一則網路健康謠言可能包含兩種以上之主題。在295則健康謠言中，共有211則謠言僅屬於一種主題，佔所有謠言的71.5%；涵蓋兩種主題的謠言有71則，佔24.1%；有三種主題的謠言有13則，佔4.4%。謠言主題的分佈情形，以「保健與預防資訊」主題的健康謠言最多，約有一半（49.2%）；其次為描述疾病的症狀、治療、藥物資訊等內容之「疾病與藥物資訊」，佔29.1%，其餘主題為身體功能資訊（8.4%）、健康照護與醫學倫理（1.5%）、適應資訊（1.0%），以及較難進行分類之「其他」（10.7%）。以下依序說明各主題健康謠言。

表2　健康謠言分類統計

健康謠言分類	分析單位(次)	百分比(%)
保健與預防資訊	193	49.2
疾病與藥物資訊	114	29.1
其他	42	10.7
身體功能資訊	33	8.4
健康照護與醫學倫理	6	1.5
適應資訊	4	1.0
小計	392	100.0

資料來源：本研究整理

(1) 保健與預防資訊：提供有關身體保健、疾病預防等相關資訊，含有此主題的健康謠言，通常多會宣稱進行某些行為、食用某些食品可以達到保健、預防疾病的效果。

(2) 疾病與藥物資訊：包括疾病的病徵、症狀、診斷、治療、癒後與藥物的資訊，含有此主題之健康謠言通常會描述某些藥品可能造成的副作用；或針對某些疾病提出某些「據說很有效果」的偏方或民族療法，建議收訊者嘗試這些看似無害的方法。

(3) 身體功能資訊：包括解剖學、生理學、性教育、懷孕與老化資訊等，通常有關身體構造、生理機能運作方式，容易讓收訊者產生其描述的內容是「合乎常理」的感覺。

(4) 健康照護與醫學倫理：係指提供有關醫師的資歷、醫院與醫師的評估、醫護診所或機構的選擇、健康照護的支付問題等議題等資訊。

(5) 適應資訊：凡提供有關治療方法的過程、藥物使用、疼痛控制及居家照護等內容的資訊，皆屬於此。

(6) 其他：凡無法歸類於上述五種類型者，本研究一律歸類為「其他」。根據分析發現，約有10.7%的健康謠言歸類於「其他」，其內容主題主要包

括食安、政策、特殊事件等。

2. 謠言指涉目標

健康謠言指涉目標的部分，細分為謠言所述對象、內容發生時間、內容發生地點三個項目進行分析。

(1) 謠言所述對象：根據汪志堅與駱少康（2002）的研究結果，並經過前導研究加以調整後，將謠言所述對象分為五類：特定公司/團體、特定個人、某一普遍存在事件、某種食品/用品、某一特定行為。在網路健康謠言中，描述對象以「某一特定行為」及「某種食品/用品」為最多數，分別佔42.4%及41.2%。另外有8.7%的健康謠言是有特定針對的對象，如特定公司/團體（7.5%）、特定個人（1.2%）；其他對象則占1.2%。由此結果可發現，指名道姓的謠言在健康謠言並不常見，此點與汪志堅與駱少康（2002）之研究結果有所不同。其結果顯示，有46.3%謠言係針對特定（具名）對象（公司、團體、個人），或許是因為該研究並沒有針對特定謠言類型進行分析，然本研究最常出現的健康謠言主題為「保健與預防資訊類」，多在呼籲民眾食用某種食品（多為天然食材，例如橄欖油），或採取某種行為（飯水分離法），因此少見具名對象出現於謠言文本。

表3　健康謠言所述對象統計

健康謠言所述對象	分析單位(次)	百分比(%)
某一特定行為	142	42.4
某種食品/用品	138	41.2
特定公司/團體	25	7.5
某一普遍存在事件	20	6.0
其他	6	1.8
特定個人	4	1.2
小計	335	100.0

資料來源：本研究整理

(2) 謠言發生的時間：一般謠言內容發生的時間可分為下列四類：即明確日期、模糊日期、無日期，及持續發生。本研究所分析的295則謠言，有22%的謠言僅提供一模糊日期，如「去年」、「幾年前」、「最近」等用詞；而提供明確發生日期的僅有7則，佔2.4%。其餘75.6%的健康謠言並無特定發生日期（佔31.9%），或是持續發生之事件或現象（佔43.7%）。從分析結果可發現，多數健康謠言並沒有明確發生日期，雖符合謠言組成要素之「模糊性」特點，但不利於收訊者進行查證（Allport & Postman, 1947）。

(3) 謠言發生的地點：謠言所指稱地點可分為精確地點、模糊地點及無地點三類。在本研究所分析的健康謠言，195則健康謠言並未提及任何地

點，佔66.1%，表示多數健康謠言並不會特別提及事件發生的地點；75則謠言僅提供模糊、不精確的地點，佔25.4%；而描述精確地點的謠言，佔8.5%。與「內容發生時間」相同，大多數健康謠言未提及明確的內容發生地點，增加健康謠言的「模糊性」。

3. 謠言佐證證據

謠言佐證證據可分為七類：照片/圖示/影片、專家/專門團體/研究報告說法、專有名詞、本人親身經驗、親友親身經驗、其他親身經驗案例、聯絡方式/查證管道。由於謠言訊息的「重要性」或「可信度」會影響謠言的產生及傳播，為提升謠言的這兩種屬性，通常不會僅提供一種來源或證據，極可能同時提供圖片、專有名詞及親友親身經驗作為佐證，因此多數健康謠言會有2種以上的佐證證據。本研究分析的健康謠言，僅有21則謠言沒有託稱相關證據，佔7.1%。提供兩種證據者佔最多數，計有123則，佔41.7%；其次為僅提供一種證據者，佔28.1%，計有83則。其餘則提供3至5種證據之謠言，分別有58則、8則、2則，各佔19.7%、2.7%及0.7%。

所分析的健康謠言，有59.6%的健康謠言內容有使用專有名詞，或提出專家、專門團體、研究報告之說法，以增加謠言的專業性及收訊者對訊息的相信程度，前者佔31.7%，後者則佔27.9%；於內容提供親身經驗的則有171筆資料，共佔31.4%；其餘則提供照片、圖示、影片或相關人士聯絡方式、資料查證管道，兩者僅佔5.9%及3.1%。

表4　健康謠言佐證證據統計

健康謠言佐證證據	分析單位(次)	百分比(%)
專有名詞	173	31.7
專家/專門團體/研究報告說法	152	27.9
親友親身經驗	60	11.0
本人親身經驗	56	10.3
其他親身經驗案例	55	10.1
照片/圖示/影片	32	5.9
聯絡方式/查證管道	17	3.1
小計	545	100.0

資料來源：本研究整理

根據分析結果可發現，支持健康謠言的證據多以「專業說法」及「親身體驗」為主。對收訊者而言，兩者皆有一定程度的說服力，卻也都難以查證；前者對收訊者而言，通常不易接觸到此類資訊的擁有者，例如醫師或研究員，同時較少具備相關專業知識足以查證該資料正確與否；後者則因無法很容易接觸到親身體驗者，而無法求證經驗的真偽。因此佐證證據的提出，反而會增加健康謠言的「模糊性」，進而促成健康謠言的產生以及後續謠言的散佈。

4. 謠言主張

謠言主張的分析架構係根據汪志堅與駱少康（2002）的研究及前導研究後得出的編碼架構，可分為抵制/拒絕使用、注意/警惕、求助、建議進行動作、分享新知等五種。295則健康謠言中，超過半數的健康謠言具有兩種主張，共計174篇，佔58.98%；僅有一種主張以及提出三種主張的謠言，分別佔18.9%（56篇）及20.68%（61篇）；其餘僅有4則謠言提出四種主張，佔1.36%。就謠言主張的類型而言，謠言主張最多者為「注意/警惕」以及「分享新知」，分別有207筆及200筆，佔34.3%及33.2%；其次為「建議進行動作」，有119筆，佔19.7%；而「抵制/拒絕使用」則有74筆，佔12.3%；最後則是「求助」，僅有3筆，佔0.5%。

表5　健康謠言主張統計

健康謠言主張	分析單位(次)	百分比(%)
注意/警惕	207	34.3
分享新知	200	33.2
建議進行動作	119	19.7
抵制/拒絕使用	74	12.3
求助	3	0.5
小計	603	100.0

資料來源：本研究整理

㈡ 網路健康謠言表現方式

謠言表現方式部分，細分為謠言字元數、謠言敘述人稱、謠言託稱來源及內容事件陳述方式四項目。

1. 謠言字元數

在字數方面，本次樣本的295篇謠言，字元數共有192,592字，平均單篇謠言有653字元。部分謠言僅提供翻拍圖片或外連網址而未提供其他內容，在此情況下謠言內容計算為0字。網路健康謠言中，600字元以下的謠言即佔55.2%，已超過樣本一半。再進一步分析，可以發現近八成的健康謠言（79.2%）的字元數在1,000字以內，超過1,000字以上者佔所有健康謠言之20.7%。

2. 謠言敘述人稱

在謠言敘述人稱部分，分為第一人稱、第三人稱及無明顯人稱等項目。其所佔比例最高者（47.8%）為無明顯敘述人稱，其次依序為第一人稱（33.6%）、第三人稱（18.6%）。以第一人稱進行謠言敘述者，傾向於描述自身親身經驗，常會使用「我們」、「我們女生」等第一人稱說辭，對收訊者而言相對親切，容易產生與自己「密切相關」或「我們是同類」的感覺。此外，使用第一人稱描述者，傾向於分享個人經驗、心得，期望能讓他人借鏡、產生警惕。使用第三人稱者，可觀察出謠言發訊者傾向於站在旁觀者角度去描述與分析，甚至評論某

些事件或行為。另外，部分第三人稱描述的健康謠言，係採用類似新聞報導的口吻。

3. 謠言託稱來源

謠言託稱來源採開放式編碼，經過分析後可歸類為本人、親友告知、老師、醫生、病患、專家/專門團體、國內外醫學、研究報告、國內外政府單位、國內外新聞報導、書籍期刊、電視節目、網路轉載、即時通訊與社群媒體、轉寄郵件、無明顯來源等15類。

295則網路健康謠言，有32.2%（95則）的謠言沒有描述明顯的託稱來源，其餘67.8%（200則）的謠言則有提及得知該謠言的來源與管道。其中18.5%的謠言託稱來源為本人之外，其餘謠言皆來自他人、相關媒體，佔81.5%。進一步分析，親友告知（21%）、醫師（17%）及國內外新聞報導（12%）為本人以外最常見的託稱來源；同時，新聞媒體、書面、網路、虛擬社群等訊息傳播管道，佔近3成（28.5%）的比例。

表6　健康謠言託稱來源統計

謠言託稱來源	謠言則數	百分比(%)
親友告知	42	21.0
本人	37	18.5
醫師	34	17.0
國內外新聞報導	24	12.0
轉寄郵件	16	8.0
國內外醫學、研究報告	11	5.5
國內外政府單位	9	4.5
專家/專門團體	7	3.5
電視節目	5	2.5
網路轉載	5	2.5
即時通訊與社群媒體	4	2.0
書籍期刊	3	1.5
老師	2	1.0
病患	1	0.5
小計	200	100.0

資料來源：本研究整理

4. 內容事件陳述方式

根據前導研究結果，內容事件陳述方式可分為敘事型、守則型、推論型、新聞雜誌報導型、清單型，和未直接提供內容等6種。其所分析的295則網路健康謠言中，僅有一種陳述方式者佔69.5%；包含兩種陳述方式的佔28.8%；其餘1.7%則包含3種陳述方式。敘事型為網路健康謠言最常見的陳述方式，計有193筆謠言，佔49.5%，意即近半數謠言係以敘事方式進行內容事件的描述。其次為新聞雜誌報導型以及推論型者，分別有69筆及61筆，佔17.7%及15.6%。

表7　健康謠言內容事件陳述方式

內容事件陳述方式	分析單位(次)	百分比(%)
敘事型	193	49.5
新聞雜誌報導型	69	17.7
推論型	61	15.6
清單型	36	9.2
守則型	19	4.9
未直接提供內容	10	2.6
其他	2	0.5
小計	390	100.0

資料來源：本研究整理

㈢各主題網路健康謠言綜合分析

1. 內容特徵

根據分析結果，整理各網路謠言主題特徵如表8。從表8可看出，除了健康照護與醫學倫理外，其餘主題內容描述對象都以「某一特定行為」為主，「某種食品/用品」也同時是疾病與藥物資訊、保健與預防資訊等謠言主題的主要描述對象。健康照護與醫學倫理、保健與預防資訊，及身體功能資訊等三項主題，其描述的事件主要以「持續發生」者為多數，所有主題幾乎都沒有提及明確的發生時間。同時，僅有適應資訊主題較常提供精確的事件發生地點，其他主題幾乎都沒有提供地點、或僅提供模糊的方向。

在謠言佐證證據部分，多數主題都會提及「專有名詞」以加深訊息內容的說服力，僅有健康照護與醫學倫理主題較常採用「本人親身經驗」做為佐證。適應資訊、健康照護與醫學倫理、保健與預防資訊的謠言中，最常見的主張是「注意/警惕」，希望可以引起收訊者的警覺心、注意可能的影響；疾病與藥物資訊及身體功能資訊則多以「分享新知」為主。

表8　健康謠言各主題內容特徵整理

謠言主題	謠言所述對象	發生時間	發生地點	佐證證據	謠言主張
疾病與藥物資訊	某一特定行為、某種食品/用品	無日期	無地點	專有名詞	分享新知
適應資訊	某一特定行為	模糊日期	精確地點	專家/專門團體/研究報告說法	注意/警惕
健康照護與醫學倫理	特定個人、某一普遍存在事件	持續發生	模糊地點	本人親身經驗	注意/警惕
保健與預防資訊	某一特定行為、某種食品/用品	持續發生	無地點	專有名詞	注意/警惕
身體功能資訊	某一特定行為	持續發生	無地點	專有名詞	分享新知
其他	某種食品/用品、某一特定行為、特定公司/團體	無日期	無地點	專有名詞	注意/警惕

資料來源：本研究整理

2. 表現方式

綜合分析結果，整理各主題謠言表現方式如表9。從表9可看出，多數主題之健康謠言內容平均字元數為600~800字，僅適應資訊、健康照護與醫學倫理兩種主題平均字元數較多，為900~1,100字左右。健康謠言主要的敘述人稱，以使用第一人稱及不使用明顯人稱為主，其中「健康照護與醫學倫理」較常使用第一人稱來敘述事件，與謠言佐證證據多採用「本人自身經驗」相符。另外，值得注意的是，當一篇謠言並無明顯使用敘述人稱時，字數也明顯較少，例如「保健與預防資訊」、「身體功能資訊」、「其他」等三類，或許可以推論是當謠言沒有使用敘述人稱時，大多僅能藉由事實性的說詞以舉證，較少透過個人或聽聞等資料託稱來源，也導致平均字數較短。

在內容事件陳述方式部分，除適應資訊外，其他主題皆多採用「敘事型」來描述謠言的目標事件。由此可知，健康謠言基本上都傾向於採用時序的說故事、講述事件發生前因後果的方式來描述謠言事件，相對於其他陳述方式，對收訊者而言更為親切、更能吸引收訊者的注意及好奇心，並願意閱讀該訊息。

表9　健康謠言各主題表現方式整理

謠言主題	平均字數	敘述人稱	謠言託稱來源	內容陳述方式
疾病與藥物資訊	729	第一人稱	無明顯來源、本人	敘事型
適應資訊	927	第三人稱	醫師	新聞雜誌報導型
健康照護與醫學倫理	1,089	第一人稱	本人	敘事型
保健與預防資訊	606	無明顯人稱	無明顯來源、醫師	敘事型
身體功能資訊	714	無明顯人稱	無明顯來源、醫師	敘事型
其他	653	無明顯人稱	親友告知、無明顯來源	敘事型

資料來源：本研究整理

㈣ 健康謠言查證結果分析

謠言查證結果依據實際分析後，查證結果為正確訊息的謠言合計61則，佔22%；「真實訊息」有5則，佔2%，係指查證為真實的訊息，但其內容並非正確訊息，或其他相關專家、醫師對其正確性持保留態度；錯誤訊息152則，佔52%；部分錯誤、部分正確的謠言有46則，佔16%；缺乏證據而無法證實對錯的有19則，佔6%；查證連結失效及其他則分別有9則及3則，分佔3%、1%。

所分析295則謠言，其中61則查證後為正確訊息，符合本研究定義「查證屬實之健康資訊」，以下以「正確訊息」稱之；「錯誤訊息」及「部分錯誤、部分正確」皆屬「錯誤訊息」，計有198則。後述之健康謠言「正確訊息」與「錯誤訊息」內容特徵與表現方式，則僅就這259則健康謠言所得之分析結果進行探討。

1. 內容特徵

依照健康謠言查證結果，整理其謠言內容特徵如表10。不論訊息正確與否，其最常見主題皆是「保健與預防資訊」、「疾病與藥物資訊」，與全體樣本的分析結果相同。兩者在謠言目標項目，同樣都以某一特定行為、某種食物或用

品為常見的指涉對象，所描述事件多以持續發生或沒有發生地點的為主。

為增加謠言的說服力，兩者都常採用專業說法為佐證，其中「正確訊息」較常採用專家、專門團體或研究報告說法，而「錯誤訊息」則較常採用專有名詞做為增加訊息可信度的證據，兩者稍有不同。

在謠言主張部分，兩者皆希望可以藉著訊息的傳遞，引起收訊者對某些議題的注意或警惕；此外，也希望可分享收訊者尚不了解或較少取得的新知。

表10　正確訊息與錯誤訊息內容特徵整理

		正確訊息	錯誤訊息
謠言主題		保健與預防資訊、疾病與藥物資訊	
謠言目標	指涉對象	某一特定行為、某種食品/用品	
	發生時間	持續發生、無日期	
	發生地點	無地點	
謠言佐證證據		專家/專門團體/研究報告說法>專有名詞	專有名詞>專家/專門團體/研究報告說法
謠言主張		注意/警惕、分享新知	

資料來源：本研究整理

2. 表現方式

綜合上述結果，依照健康謠言查證結果，整理謠言表現方式如表11。正確訊息及錯誤訊息在內容敘述上，皆傾向不使用任何人稱進行描述，與全體樣本相同。兩者在訊息來源上，有明顯託稱來源部分，除了皆常託稱其訊息源於醫師之外，正確訊息較常來自發訊者本人，而錯誤訊息則較常來自親友轉述。由此可知，即使訊息託稱來源是醫師，並不一定就是正確訊息，民眾仍不能輕信。

敘事型同樣常見於兩者在事件陳述方式上，除此之外，正確訊息較常使用新聞雜誌報導口吻來描述事件，而錯誤訊息則較會根據某些未經證實的說法來推論事件可能發生的結果；新聞雜誌報導對一般收訊者而言，相對較為可信且取得容易，然而錯誤訊息採用此方式來描述事件者，比例亦不算少數，因此收訊者亦無法根據事件描述方式來判斷訊息的真偽。

表11　正確訊息與錯誤訊息表現方式整理

	正確訊息	錯誤訊息
謠言敘述人稱	無明顯人稱	
謠言託稱來源	本人、醫師	親友告知、醫師
內容陳述方式	敘事型、新聞雜誌報導型	敘事型、推論型、新聞雜誌報導型

資料來源：本研究整理

㈤綜合討論

本研究旨在掌握網路上流傳之健康謠言態樣，透過內容分析法逐一分析健康及醫藥類謠言，期望能更深入了解網路健康謠言的內容特徵與表現方式。以下針對本研究所提出之研究問題一一進行綜合性探討。

1. 網路健康謠言之內容特徵

透過本研究分析，可勾勒出常見的網路健康謠言在內容上所呈現的樣貌。最常見的網路健康謠言主題為保健與預防資訊類，由於這類資訊適用於各種類型的目標收訊者，而非只有患病者，屬於與民眾日常生活息息相關的主題，因此成為最常見的主題。在指涉目標部分，描述對象以「某一特定行為」及「某種食品/用品」對健康可能產生的影響者居多，且多以「注意/警惕」及「分享新知」兩個訴求，闡述與描述對象的關聯。同時大部分網路健康謠言不會描述精確地發生日期及地點，而最為常見的佐證證據為「專業說法」及「親身體驗」。

網路健康謠言的內容專指與健康、醫療相關的主題，可說是與民眾切身相關的議題，符合謠言的組成要素「重要性」，因此此類謠言容易被大量傳播。汪志堅與駱少康（2002）針對綜合謠言的分析研究發現，有33.7%是攸關於衛生、健康的議題。與綜合謠言不同的地方在於健康謠言較少採用照片作為佐證證據，但兩者皆同樣會採用專業說法作為佐證；但佐證證據的提出，由於其查證不易，再加上沒有確切的日期、地點，反而會增加健康謠言的「模糊性」，也提升了謠言被誤信的潛在風險。

2. 網路健康謠言之表現方式

半數網路健康謠言字數不到600字，同時近八成健康謠言內容篇幅在1,000字以內。除了4成謠言在敘述時沒有採用明顯的人稱，另有3成採用第一人稱進行謠言事件描述，顯示發訊者傾向描述自身經驗來引起收訊者的共鳴、同感。網路健康謠言最常見來自於親友以及醫生的說法，自身的經驗也常見於謠言，半數謠言的託稱來源皆屬此三者。謠言事件最常採用「敘事型」方式進行敘述，對收訊者而言較親切且容易閱讀。此外，由於新聞媒體也是常見的訊息來源，因此新聞報導的敘述形式也很常見於健康謠言。

3. 各主題網路健康謠言之內容特徵及表現方式

在內容特徵方面，不論何種主題，主要的描述對象為「某一特定行為」、「某種食品/用品」；多數議題在探討持續發生的事件，除了適應資訊主題的健康謠言有提及精確地點外，其他主題都沒有確切地點。健康照護與醫學倫理較常使用親身經驗作為佐證證據，其他主題則傾向採用專業說法來增加訊息的說服力。適應資訊、健康照護與醫學倫理、保健與預防資訊等三項主題傾向於引起收訊者的注意力或警惕；疾病與藥物資訊、身體功能資訊則多以分享新知為主要傳播目的。在表現方式部分，疾病與藥物資訊、健康照護與醫學倫理常採用第一人稱描述謠言事件，適應資訊則會使用第三人稱，其他兩個主題則沒有明顯的敘述人稱。疾病與藥物資訊、保健與預防資訊，及身體功能資訊多數沒有明顯來源。前者僅部分來自發訊者本人，後兩者則多來自醫生說法。健康照護與醫學倫理、適應資訊則分別以發訊者本人及醫生為主要訊息來源。與所有

分析樣本相同，不論健康謠言的主題為何，仍以「敘事型」及「新聞雜誌報導型」為主要的陳述事件方式。

4. 正確訊息與錯誤訊息的內容特徵及表現方式

正確訊息與錯誤訊息，兩者無論在內容特徵或表現方式所呈現的型態，並沒有太大差異；兩者常見的謠言主題及目標都相同，也都採用專業說法作為佐證證據，謠言的訴求、主張也都相同；對收訊者而言，很難透過謠言的內容特徵去判斷謠言訊息正確與否。由此可見，當正確訊息以及錯誤訊息兩者，無論在內在的目的與意涵以及外在的表現形式差距不大時，因無從判斷依據，都會造成誤判事件頻傳，僅能倚賴收訊者提升自身的健康素養，小心查證而後信之。

五、結　論

透過網路取用消費者健康資訊具有諸多潛在價值，包括民眾可更容易地取用可以客製化的資訊，且不受時間與空間限制；網路匿名性的特點，也讓使用者可毫無負擔地取用敏感議題之健康資訊，也可避免面對面溝通可能產生的尷尬感。但由於網路缺乏守門員制度，民眾透過網路取得的資訊，品質良莠不齊，若民眾不具備健康資訊篩選、批判等能力，亦即缺乏足夠的健康素養，因而誤信錯誤的健康謠言，可能會對使用者自身的健康產生負面影響。

本研究發現，查證屬實之正確訊息（即健康資訊）與錯誤訊息（即謠言），兩者常見的謠言主題及目標都相同，皆採用專業說法作為佐證證據，主要訴求也都相同；對收訊者而言，很難透過謠言的內容特性去判斷謠言訊息正確與否。在表現方式部分，兩者亦呈現幾乎相同的型態。網路健康謠言通常會採用專有名詞、專家說法或研究報告來增加內容可信度，同時也讓謠言看起來更「合理」，促使民眾傾向相信健康謠言的內容，因此本研究認為，一般資訊閱聽人對於接收到的健康資訊應多運用健康素養能力來評估內容的真偽、可信度及資訊品質，即使謠言內容所提供的專業說法是對的，也可能在流傳過程中誤植、遭竄改，最終變成錯誤訊息，因此不宜相信所謂的「專家背書」。

此外，民眾在面對自身健康出現異狀而不知所措時，容易聽信身邊親友甚至陌生人的偏方或經驗談。研究即發現，不論以「本人」或「親友告知」等兩種託稱來源為文的健康資訊，都有可能是謠言。由於網路健康謠言探討之議題與民眾的日常生活密切相關，因而有相當的重要性，但其中有部分細節相對模糊、難以查證，容易讓民眾信以為真，並加入謠言傳播的行列。因此，民眾應加強健康素養，培養閱讀、了解基本的資訊品質評估能力，對於無法完全了解的健康資訊，也能夠知道運用何種管道、資訊加以查證；若有健康相關的疑問應先詢問相關專家、醫師，以獲得正確的資訊，避免因誤信偏方、民間療法，對自身健康產生負面影響。

根據本研究結果，可提出實務應用與後續研究兩個方向的建議。實務應用方面應著重於健康素養教育。對於相關單位，包括各地的衛生所、醫院衛教單位、公共圖書館等，定期舉辦健康素養講座，協助使用者獲取、了解，與詮釋基本的健康資訊，並能教導民眾利用此類資訊及服務，培養批判性思考的能力，進行健康資訊品質的初步評估與健康決策，最終促進個人健康。此外，若沒有進行闢謠，健康謠言仍有可能繼續流傳，在傳播過程中會因不斷地融匯更多方的說法與佐證，也會變得越來越有說服力。相關單位應積極扮演闢謠的角色，定期將網路上流傳的健康謠言進行查證與說明，且以客觀中立者的闢謠對於澄清謠言有相當的效果。圖書館一直以來一視同仁的提供使用者所需的任何資訊，與健康資訊並無直接相關，也不屬於健康、醫學專業單位，因此適合扮演「客觀中立的闢謠者」角色。

基於研究範圍、對象與方法的限制，對於未來研究提出兩方面的建議，分別為謠言內容研究及閱聽者研究。針對謠言內容研究部分，本研究僅針對「網路追追追」網站被網路使用者舉報為健康謠言的文本進行研究，並未針對謠言實際所使用的文字及語言進行分析。因此，建議後續研究可藉用文字探勘的技術分析謠言的句型結構，萃取出健康謠言的常用詞彙與共現字關係，建立健康謠言常見詞彙清單，並透過共現字，以模擬仿撰一篇健康謠言的版型（template），提醒民眾若接收到健康訊息時，先檢視文句中是否包含這些常見詞彙，或閱讀起來是否與版型相仿，則須有高度警覺，以免誤信謠言。其二研究建議則是設計實驗並徵集健康謠言的閱聽者閱讀各式版本的健康謠言，從不同謠言撰寫方式、託稱來源、佐證證據、目的與主張等，分析這些變項如何影響閱聽者信服該謠言的程度，並進一步分析健康謠言對於民眾健康決策的影響。

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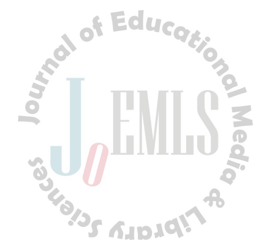
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A Content Analysis of Internet Health Rumors

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Research Article

Abstract

This study used content analysis method to investigate Internet health rumors on Rumor Breaker, specifically on the characteristics of content and format, the similarities and differences by themes, and the comparison of health information and health rumors. The results of the study indicated that the most common theme of health rumors is health and prevention information. The health rumors commonly described the influence of "particular behavior" and "specific food or appliances" on one's health; also most of the health rumors didn't specifically mention when or where the events happened. To make the information more persuasive, the health rumors provide "statement from professional" and "personal experience" as evidence and proof. 30% of the health rumors would describe the events in first person narrative. Half of the health rumors are set to come from doctors and one's personal, family and friends' experience. It's much familiar to the receivers by narrating the event or reporting the event as news. The characteristics of all themes of the health rumors are similar to the characteristics of all rumors under investigation. Also, there are less different characteristics between the verified information and the rumors. This study hopes to provide a guide for verifying health information, and to support health promotion and education through literacy in identifying rumors.

Keywords: *Consumer health information, Rumors, Health rumors, Content analysis*

SUMMARY

People care about their health and wellbeing. The concept of health and wellbeing can be embedded at three levels: personal, societal, and national. One way to raise the health awareness is through the acquisition of consumer health information. Internet has been a driving force in the raising trend of improving and sustaining better quality of life as it has become an important source of consumer health information. Various types of health information are made available on the Internet including unverified information and even health rumors. What is communicated in the health rumors is closely related to the everyday life of not only patients, but also almost everyone. It may be harmful to one's

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health and to the wellbeing of the society if the information being circulated is not factual or completely false. In the past few years, Taiwan has been suffering from food safety issues such as cooking oil and milk powder since 2012. If health rumors spread through society during difficult time like food safety scandals and people believe the rumors and act accordingly, the consequences may be catastrophic. This study takes on a content analysis approach to examine Internet health rumors, with aims to uncover the textual and structural characteristics. This study is organized around four research questions: (1) What are the textual characteristics of the Internet health rumors? (2) How are the Internet health rumors articulated? (3) How are the Internet health rumors different across various themes of rumors regarding the textual and structural characteristics? And (4) How is verified Internet health information different from Internet heath rumors regarding the textural and structural characteristics?

This study collects 295 Internet health rumors that are pre-categorized as “medical” and “health” rumors on Rumor Breaker (http://rumor.nownews.com/), a Taiwan-based website which refutes rumors. The website has been operating in Traditional Chinese since 2000. It currently collects and refutes rumors in 21 categories as of 2014. The categories include technology, urban legends, cosmetics, crime, etc.. The rumors published on the website are divided into unexamined rumors and examined rumors. For this study, Internet health rumors collected for data analysis are “examined rumors”, which means the rumors under investigation have been examined for their accuracy. An analysis report is provided with the details on analysis procedures and methods, findings, and acknowledgement. The samples may represent both online health information and Internet health rumors. Data analysis is conducted qualitatively and quantitatively. The content of the Internet health rumors is first analyzed qualitatively to construct codes for each theme, and each code can be reasoned as the properties of the theme. Then the analysis was conducted quantitatively with frequency and percentage distribution to determine patterns and characteristics.

The textual characteristics can be discussed from the aspects of health rumor themes, objects of the rumors, supporting proof for the rumors, and claims of the rumors. Six health rumors themes were discovered. They are health and prevention (49.2%), disease and treatment (29.1%), other/uncategorized rumors (10.7%), human body function (8.4%), healthcare and medical ethics (1.5%), and indication information (1%). The Internet health rumors commonly describe the influence of a “particular behavior” and “specific food or appliances” on one’s health, without providing accurate details on time and location. For example, digesting high-temperature food or drink can be perceived as unhealthy behavior and soft drink can be perceived as unhealthy food. Therefore, to make the rumors

more believable and persuasive, the health rumors provide statements or cited quotes from “medical professionals” and “personal experience” as evidence and proof. The excessive use of medical terminology is also common in Internet health rumors as a mean to enhance credibility and authority. Evidence like this is used in the narratives of rumors for notification and alert, as well as the sharing of news or information.

Regarding the findings of how the Internet health rumors are articulated, the discussion can be divided into length of rumors, point of view in the rumor statements, originator of the rumors, and narrative style. The results show that the average length of the Internet health rumors is 653 words. More than half of the health rumors are shorter than 600 words, and 80% of the Internet health rumors are shorter than 1,000 words (Traditional Chinese) in length. 33.6% of the health rumors describe the events or the situations or make the claims in first-person perspective, in order to show the impression that the event is happening to the rumor originator or narrator. It may imply that the rumor originator is prone to describe his or her experience in hope that rumor receivers may identify themselves with the rumor. 18.6% of the rumors use third-person perspective. A closer examination of these rumors reveals that the rumors using third-person perspective are more evaluative, analytical, and investigative than the rumors using other points of view; and the writing style is similar to news reports. Half of the Internet health rumors are set to be coming from doctors or an individual’s personal, family and friends’ experience. It’s much more trustable and friendly to the rumor receivers if the event is narrated or reported as news. The information sources of how these rumors spread are news and reports, Internet, and social media. This study further identifies six types of Internet health rumors narrative styles: narrative (49.5), news reporting (17.7%), reasoning (15.6%), listing (9.2%), guideline-based (4.9%), can not identified and others (3.1%). Most health rumors (69.5%) adopt single narrative strategy, while 28.8 % adopt two strategies.

The characteristics of different themes of the health rumors are similar to the characteristics of all rumors under investigation. In addition, there is not much difference between verified online health information and Internet health rumors. The Internet health rumors, thus, will be potentially misleading because both verified health information and Internet health rumors use statements from health and medical professionals as evidence and justification. It causes further difficulty in distinguishing the verified health information from the health rumors because both textual and structural characteristics are almost identical.

This study aims to provide a guide for verifying trustable online health information and to support health promotion and education through literacy by identifying problematic health information content and distinguishing

Internet health rumors from truth. According to the results, we are able to make several implications and future research directions. For everyday health information seekers, they are advised to evaluate the information they receive with critical thinking skills. Also, information seekers should improve their information literacy and health literacy skills so that they are able to identify the information channels and sources to verify the health information that is not fully comprehended. If health problems occur, an individual should firstly seek advice from doctors or other medical professionals to avoid potential danger or health threats from mistakenly believing the rumors to be accurate. From an institutional perspective, collaboration between public health institutions and clinics or hospitals, and public libraries or medical libraries on local campus should be established to provide lessons or training sessions on health literacy and health promotion. Public or medical libraries, on the other hand, should solicit health literacy and education materials from health-related organizations, and make the materials accessible to library patrons. Lastly, these health-related organizations should regularly investigate and examine rumors and participate with other organizations, such as public libraries, to guard the accuracy of online health information effectively.

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綜整學生、教師與教學情境考量的遠距教學預測模型

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摘要

本研究旨在探討於遠距教學情境中，學生學習能力和學習策略、學生評量教學成效、同步遠距教學，與線上教材對學生自評學習效益的影響；並分析學生評量教學成效和同步遠距教學的交互作用，以及線上教材的中介效果。本研究結果顯示，學生評量教學成效與同步遠距教學之交互作用會影響線上教材與學生自評學習效益。對遠距教學評價高的學生，該交互作用的影響會比評價低的學生更為明顯。本研究亦發現，學生評量教學成效、線上教材，及同步遠距教學的品質掌控，是決定遠距教學學習效益的關鍵。其中，線上教材能在多數學生評量教學成效面向之間發揮顯著的中介效果，以促動學生自評的學習效益。

關鍵詞： 同步遠距教學，線上教材，學生自評學習效益，學生評量教學成效，學習能力，學習策略

緒　　論

資通訊科技發展使得教學與學習日趨多元化，科技於數位學習、行動與無所不在學習、雲端或開放課程等應用，其目的為促進達成支援特定教學實施與提供不同面向的學習資源。儘管如此，即時群播之遠距教學仍有其重要性，也是目前大專院校為了分享課程與教學資源，或欲克服時空問題，乃至擴展學生視野等目的，仍然廣為實施的教學型式；包括校內部同校區之遠距教學、跨校甚至跨國之國際遠距課程等。而實施型態亦有單點主播、多點群播，以及教師共同合授互為主播與收播等作法。然而無論何種型式，都必須確保教學成效、師生互動及教材等之品質（岳修平，2000；Lin, Yueh, & Minoh, 2009）。

學生評量教學（student evaluation of teaching, SET）為高等教育中評估教學成效常見的方式（Braskamp & Ory, 1994; Marsh & Roche, 1997）。SET旨在從學

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生立場獲得教師教學的相關資訊，多在學期末進行，讓學生就其學習經驗填寫評量問卷而得。而SET包含的面向不盡相同，如Marsh（1980）採用了11個量表測量，分別為：學習價值、講師熱忱、課程組織、團體互動、個體和諧、學習單位長度、考試、作業、課程難易度與負荷量、整體課程評量，以及整體教學評量。Jackson等（1999）指出，為確保一般教學品質，SET應涵蓋師生和諧關係、課程價值、課程組織與設計、公正評分，以及課程份量與難易度。

葉連祺、董娟娟、楊世英、陳仁海與蕭芳華（2005）蒐集國內18所大學教師評鑑之調查項目共51項，並將調查範疇分類為教師教學表現與學生學習參與兩大類。Heckert、Latier、Ringwald與Silvey（2006）認為，SET應包含課程整體評量、教師教學法技能、師生關係和諧，以及學生知覺課程難易度等四個面向。而隨著資訊傳播科技在教育現場的普及應用，需評估的SET面向也有所增加。除了教師教學表現項目較為固定外，不同的課程設計會有互異的評估項目，需要視評量重點進行適當的修改。好比Steif與Dollár（2009）即提出，對教育軟體的使用評鑑應包涵：實際使用情形、學習效益，以及自我調節學習等指標，才能了解其效益。又如Yueh、Chen、Chiu、Lee與Wang（2012）亦在其所發展的SET量表中納入同步遠距教學的不同面向，評量即時群播課程教師教學與學生學習效益。

本研究即就國內一項工程領域課程計畫做為研究場域。該計畫涵蓋全國數十所大專院校之奈米領域高科技課程與教師，以即時群播遠距教學的方式進行跨校教學，並提供數位教材輔助學習，讓學生可以在課堂結束後取得學習資源，同時整合國內大專院校之教學資源，以達到資源共享的目的。本研究所欲探討之SET面向包含學生學習能力和策略、教師教學成效、遠距教學實施、線上教材，與學生學習效益等。本研究所提教學成效係指「學生評量教學成效」，學習效益係指「學生自評學習效益」，遠距教學實施係指透過即時視訊系統進行之「同步遠距教學」的實施。

具體研究目的則包括：㈠探討學生學習能力和學習策略、學生評量教學成效、同步遠距教學，與線上教材對學生自評學習效益的影響；㈡分析學生評量教學成效和同步遠距教學的交互作用；以及㈢分析線上教材可能扮演的中介角色。前述課程因其操作方式包含應用即時群播科技與線上教材，且為一對多之主收播教學實施，其教學成效評量與影響因素評估應不同於一般課堂型式所採用面向，有其深入研究之必要性，亦符合本研究目的，希望研究成果亦可作為其他類似之大型課程群組教學成效評量之參考，並對遠距教學領域之理論研究有所貢獻。

二、文獻探討

㈠ SET與學習效益

從高等教育實施教學評鑑的觀點可以看出，過往以教師為中心的授課評量，已逐漸轉變為以學習者為中心的學習評量，此即為SET的精神（Yueh et al., 2012）。Marsh與Roche（2000）進一步強調，應將「學習價值」納入以成為SET的重要面向。彭森明（2008）亦認為，透過學生評鑑教學與學習效益，可以幫助尋求有效的教學策略，進而提升大學校院之教學品質。學習效益除了以學生課業表現做為測量指標外，亦有學者進一步以不同性質的學習效益進行評量，如成就測驗，與包含認知、技能、情意三類型的自我覺知效果（張基成、徐郁昇，2011），或學習滿意度與知識取得（Mackey & Freyberg, 2010）。

為了讓大學生在畢業後具備面對變化快速的社會挑戰與問題解決的能力，現今社會多強調跨領域能力的培養。Lattuca、Knight與Bergom（2013）即針對來自31個單位、5,249名工程領域的大學生進行調查分析，以發展學生能夠以跨領域方式進行思考或工作的評量工具。本研究情境與Lattuca等人研究相似，遂依該研究成果進行問卷編製，研究團隊同時考量SET會受到來自教師、學生，與課程三方面的影響（Centra & Gaubatz, 2000），因此納入SET各重要面向和本研究遠距教學型態加以探討。以下即分別討論學生學習能力與學習策略、教師教學成效、同步遠距教學，以及線上教材等，對學生自評學習效益所產生之影響。

㈡ 學習能力與學習策略對學習效益的影響

自2011年起，國內大學校院開始將學生基本素養與核心能力指標，列為系所評鑑的重要項目（王保進，2009）。彭森明（2008）提出，大學教育應培養學生具備以下七種學識、能力與素養，分別為：專業學科高深知識及技能（以系所或學門分類）、職場能力（如人際溝通能力、領導能力、團隊合作能力與抗壓力）、高層次思考能力（如解決問題能力、批判思考能力、推理能力與創造能力）、專業學科基礎能力（如微積分、統計學與科普知識）、自我學習與進修能力（如閱讀能力、基本數理知識以及基本資訊科技能力）、人文知識（如文學、藝術、音樂、法律及保健知識），以及人品素養（如公民意識、社會關懷、國際視野、倫理與道德情操）。

而鄭英耀、葉麗貞、劉昆夏與莫慕貞（2011）則以國內外關於公民核心素養、大學教育目標、大學生基本能力，與就業力技能為基礎，建構適用於台灣之大學生的六大基本能力，包括：專業及基礎能力（如專業學識、實證推理能力等）、創意與問題解決（如創造力、自我潛能開發等）、人際溝通（如尊重與接納態度、口語表達能力等）、品格與公民素養（如正向人格特質、人文素養與藝

術鑑賞力等)、國際視野(如外語能力、開放視野等),和自主學習(如獨立研究能力、訂定學習目標及策略等)。本研究綜整上述文獻認為,大學生應培養以下十種能力:基礎科學知識、藝術人文素養、理論和實務統整能力、實驗相關技能、作學問的能力、實作能力、創造思考能力、跨領域知識統整能力、資料蒐集能力,以及資料組織/整理能力。

除一般能力外,學生學習能力的培養與學習策略的訓練也相當重要。好比說,自我調控學習(self-regulated learning),包括後設認知、動機與行為之調控策略,可幫助學習者在學習歷程中有效設定目標、主動建構知識並調控其學習行動(Pintrich, 2004),若能妥善學習應用,應可有效幫助學生達成學習目標。此外,程炳林(2002)研究結果顯示,藉由大學生所使用的學習策略,可以預測其課業表現。劉玉玲與薛岳(2013)研究指出,學生的數學學習成就會受其學習策略所影響。學習策略的能力是可以在後天培養的。黎玨岑與洪佳玟(2013)即建議,學童應從年幼便開始透過一定的方法或步驟來培養學習策略的運用能力,以養成良好的學習習慣。Bong(2004)提出,學生自評學習能力之信念與其對應學科之學習效益具有高度的關聯;而Eilam、Zeidner與Aharon(2009)的研究則發現,學生人格特質除了直接影響學習表現外,更會透過自我調控學習策略調節其學習效益。為了更能夠面對變化快速的社會挑戰,除了所學專業外,大學生更須培養人文素養與深層思考,並具備有問題解決的能力,以及促進培養學習能力之學習策略。

㈢教學成效及遠距教學對學習效益的影響

國內即時群播遠距教學實施經年,雖然教師與學生多可接受遠距教學且泰半肯定其效果,但由於即時群播現場分為主播與收播兩端,位於收播端的學生易因與授課教師處於不同空間而產生互動不佳的問題,進而覺得學習受到限制(岳修平,2000;Shotsberger, 2000)。Guri-Rosenblit(1999)指出,在克服同步遠距教學的科技面問題後,便須面對教師是否具備充分的知識與技術、是否有妥適準備、是否提供適於情境的學習教材等問題。教師容易受到網路斷線或設備干擾,無法即時注意到收播端學生的反應而影響師生互動,進而降低其教學成效(張瓊穗、陳宜欣,2003)。晚近研究或因設施改善,多有正向評價,如李鴻亮與廖惠君(2009)結合線上影音課程與面授輔導兩種方式對國小學童進行英語學習補救教學,其研究結果顯示,遠距教學對學生學習效益有很大的幫助。Mackey與Freyberg(2010)將情意知識學習效益以學生滿意度作為測量工具,認知知識學習效益以知識取得測之,該研究結果顯示,傳統教學組有較高的學習滿意度(情意知識的學習效益),但在知識取得(認知知識的學習效益)上兩組並無顯著差異。

另一方面,蒯光武與陳淩卿(2010)探討網路教學應用影音部落格的影響

因素，並提出成功的網路教學系統須以設計良好且具備豐富素材的教學內容為基石，讓多媒體素材發揮教學實效，進而提升學習效益。于第（2011）探討結合非同步遠距課程之教學設計與教學成效的關係，其研究結果顯示，88%的學生對於結合遠距與面授混合式課程的教學成效感到滿意，同時也會推薦同學或學弟妹選修。由於有學生反映在課程執行期間，師生互動不佳，因此作者亦建議非同步遠距的教學方式應以不超過二分之一學期為宜，以增進修課學生的學習效益。溫嘉榮與張建原（2014）的研究則以學生自我學習、教學技巧、教師教學，及課程與教材內容做為評量教學成效的面向，該研究結果顯示，多數學生肯定遠距教學之教學成效與遠距課程的實施方式。遠距教學常使用影片及多媒體等線上教材作為輔助的學習素材，本研究將該學習素材歸類為線上教材，將與教師在遠距教學現場的掌控和學校的資源和支持歸類為遠距教學，並將學生對教師教學和課程規劃之評價歸類為學生評量教學成效，以示區隔。

因為遠距教學的實施品質，包括其教學資源的豐富和支持的持續，會促使教師對課程設計的適時調整，進而可能影響學生對其教學成效的評價（The Accrediting Commission for Community and Junior Colleges, Western Association of Schools and Colleges, 2012; The Association to Advance Collegiate Schools of Business, 2007）。同時，教師本身的教學熱忱與課程準備，亦可能影響其在同步遠距教學現場的表現和課後的輔導品質，而使學生對同步遠距教學評量結果亦會產生影響（Crawford-Ferre & Wiest, 2012; Yang & Cornelious, 2005）。此即，同步遠距教學和學生評量教學成效均會影響學生自評學習效益，且兩者之間具有潛在的交互作用，本研究據此提出以下兩個研究假設：

H1：同步遠距教學可預測學生自評學習效益；

H2：學生評量教學成效與同步遠距教學對學生自評學習效益具有交互作用。

㈣ 線上教材、遠距教學、教學成效，和學習效益之關聯

無論同步或非同步教學實施，線上教材都是保證教學成效的最重要因素之一，尤其在遠距教學中，由於師生不一定在同一時空，為了讓遠距教學有較佳的成效，因此教材與教學方法皆須嚴謹地規劃與設計（Latchem & Lockwood, 1998; Yueh, Chen, Lin, & Sheen, 2014）。Palmer（2007）在其課堂上使用串流影片作為多媒體補充教材，並比較校內與校外學生對該教材的使用成效發現，兩者對使用多媒體教材有不同的看法，校外學生給予串流影片較高的教育性價值評分，並肯定其幫助理解該議題，而校內學生則僅將影片視為有幫助的補充教材。Chen與Sun（2011）的研究則顯示，使用網路自學線上教材的學生在英文檢定模擬測驗的各項目皆有進步。綜整以上，學生（特別是收播端）應可透過線上教材來跨越同步遠距教學的障礙，並提升其學習成效。

教師會以不同的教學計畫、教學方法、教材設計，與教學過程，來提升

學生學習的成效（陳寶山，2007）。Ritchie與Hoffman（1997）指出，具備互動學習的教學活動，再結合學習目標，將可增進學習者的知識。Cassady（1998）研究顯示，學生認為使用多媒體輔助教學的教師對課程內容的準備度較高。Frey與Birnbaum（2002）調查結果顯示，學生認為使用科技幫助教學的教師，在規劃其課程內容時較有組織。Singh（2003）指出，結合線上教材與傳統實體授課的混成式學習，有利於提升學生之學習成效。Dalgarno、Bishop、Adlong與Bedgood（2009）探討在遠距化學課程中加入虛擬實驗環境建置是否會有助學生學習，結果發現此一虛擬實驗情境能讓學生先熟悉其實驗，而被認為是有用的學習準備工具。石文傑與江宗霖（2012）研究亦顯示，學生對在課堂使用線上教材的接受程度高，且肯定線上教材對其學習的幫助。由上可知，學生與教材的互動即是學生應用線上教材以輔助其學習的經驗與感受。教師教學成效可能反映在教學表現與教材準備上，而兩者皆有可能影響學生學習成效。

許多學者指出，線上教材設計和輔助活動能在遠距教學扮演著促成的角色；相關研究結果亦顯示，線上教材具有中介效果（Hewitt, 2003; Swan, 2004）。Saba（2012）研究亦再度證實，教師使用線上教材系統所提供的輔助活動，在整體數位學習成效上呈現顯著的中介效果。由於線上教材可在實體課程結束後提供學生做為複習管道，對其學習成效有增強的效果，因此本研究亦認為學生（特別是收播端）應可透過線上教材來補充學生評量教學成效的不足，並提升其學習成效。也因此，本研究提出第三個研究假設如下：

H3：線上教材可在學生學習能力和學習策略、學生評量教學成效、同步遠距教學，與學生自評學習效益之間扮演中介變項的角色。

三、研究方法

本研究依據研究目的，選取跨領域科技教育平台計畫之奈米科技教育子計畫，以參與其中之即時群播遠距課程為主要研究標的，並採用非隨機抽樣之立意抽樣方法，以選修前述課程之大專院校學生為研究對象。該計畫之課程皆以視訊方式進行同步遠距教學，並搭配有建置於整合教學平台支線上教材，符合本研究之目的。

在研究工具方面，本研究以岳修平（2005）與Yueh等（2012）所發展的調查問卷為基礎，依據本次研究目的加以修改。該問卷內容包括：㈠個人背景資料：含性別、年級、就讀學校系所等資訊；㈡學習能力評量：原包含10題，經本研究前測檢驗後，刪除1題，計9題進入正式施測；㈢學習策略評量：共計4題；㈣學生評量教學成效：共計9題；㈤同步遠距教學評量：共計6題；㈥線上教材評量：共計7題；以及㈦學生自評學習效益：共計15題。本研究之學生學習成效評量未採課業成績或教師評量，是為要避免受測對象在回答其他題項

時，有因身分易被辨識，而產生社會期待之填答誤差；此即，本研究之學習成效係指學生自我覺知的效果，然為便利行文，以學習成效簡稱。另教師教學成效亦如上述，以教學成效簡稱。本研究問卷整體Cronbach's α值為0.936，各題項因素負荷量介於0.458~0.936之間，顯示此問卷各題項內部一致性相當良好。

如前所述，本研究依據研究目的邀請參與計畫的21所學校學生作為研究對象，採用非隨機抽樣之立意抽樣方法分兩階段進行施測。第一階段施測共回收253份有效問卷，其中多數為男生（83.4%）；大四生最多（44.3%），大三次之（17.4%）；學生以科技大學較多（33.3%），其次為國立大學與技術學院（皆為25%）。此樣本為因素建構組，用於進行探索性因素分析以建置適切的因素結構。第二階段施測共回收有效問卷682份作為因素驗證組，進行驗證性因素分析以確認因素的適配度，並進行路徑分析與模型建立。其中，亦以男生佔多數（80.1%）；大四生最多（39.7%），其次為大三生（21.7%）；學生來自科技大學較多（36.4%），其次為公立大學與技術學院（皆為22.7%）。由於本研究實施情境為參與工程教育遠距課程聯盟之校院系所，且皆以工程為主之課程，因此兩階段樣本各類分配，如性別、年級、學校類型等，皆符合母群之基本分佈情形。問卷回收後皆以SPSS for Windows 17.0進行描述性統計分析，並以LISREL 8.80作為結構方程式的統計工具。描述性統計分析結果顯示，兩次施測樣本略有差異，但其因素結構卻一致，代表本研究問卷具有高穩定度。

四、資料分析與討論

㈠ 探索性因素分析

本研究以因素建構組（N = 253）進行探索性因素分析，以了解各變項之因素結構組成。學習能力與學習策略兩部分，經檢驗後KMO值為0.936，Bartlett

表1　學習能力與學習策略評量探索性因素分析

因素	問卷題項	學習能力	學習策略
學習能力	實作能力	0.813	
	實驗相關技能	0.799	
	創造思考能力	0.787	
	理論和實務統整能力	0.729	
	基礎科學知識	0.667	
	藝術人文素養	0.659	
	做學問的能力	0.614	
	跨領域知識統整能力	0.599	
	資料蒐集能力	0.592	
學習策略	訂定學習計畫的能力		0.960
	訂定學習目標的能力		0.907
	管理學習進度的能力		0.894
	評量學習成效的能力		0.775

的球形檢定卡方值為2254.754，自由度為78，p = 0.000達到顯著，適合進行因素分析。本研究採主軸因素法與Promax轉軸為分析方法，萃取出特徵值大於1的兩個因素（表1），此兩個因素總解釋變異量達61.97%，顯示本研究所使用之工具乃具有相當良好的效度。

學生評量教學成效9題、同步遠距教學評量6題、線上教材評量7題、學生自評學習效益15題經檢驗後，KMO值為0.964，Bartlett的球形檢定卡方值為8394.949，自由度為666，p = 0.000達到顯著，亦適合進行因素分析。本研究採用主軸因素法與Promax轉軸為分析方法，萃取出特徵值大於1的四個因素（表2），總解釋變異量達64.52%，具有相當良好的效度。

表2 學生評量教學成效、同步遠距教學、線上教材，與學生自評學習效益之探索性因素分析

題 項	學生評量教學成效	同步遠距教學	線上教材	學生自評學習效益
教師認真教學，對教學內容與過程顯示其教學熱忱	0.936			
教師對待學生態度和善良好	0.874			
教師用心準備教學，內容充實豐富	0.784			
教師對課程內容安排適當之教學進度	0.780			
教師清楚講解教學內容，使課程容易了解	0.777			
教師在學期初曾說明評分方式且其配分適當	0.721			
教師對教材內容組織完善	0.720			
教師適當安排及運用課堂教學時間	0.678			
教師嘗試使用各種方法引起學生的學習動機	0.458			
教師嘗試與本地端及遠端學生互動		0.788		
教師嘗試在課堂中或用線上方式回答學生問題		0.749		
教師注意本地端及遠端學生學習反應		0.687		
本課程網站提供教材與線上學習活動		0.683		
整體課程網站內容規劃組織完善		0.665		
課程網站功能設計良好，容易操作使用		0.592		
整體來說，數位教材內容可助我整體學習成效			0.883	
我喜歡這種有數位教材輔助教學的教學型式			0.815	
線上數位教材對我精熟學習課程內容有幫助			0.794	
我願推薦同學觀看數位教材以增進自我學習			0.710	
線上數位教材對我複習課程有幫助			0.600	
線上數位教材品質優良			0.546	
線上數位教材設計適當			0.484	
擴展與業界人士交流互動的機會				0.794
我相信我比修課前更提升做學問與研究能力				0.770
我相信我未來職場表現上會更具競爭力				0.756
學到本課程領域的實作應用技能				0.753
本課程的學習應用到過去所學的基礎知識				0.752
能夠利用跨領域知識加強原本專業能力				0.741
認識跨領域所涵蓋不同學科領域知識				0.730
本課程的學習應用到過去所學的實驗技能				0.724
我相信我比修課前更能以多元觀點分析事情				0.695

學習跨領域之學科整合觀點	0.693
學到本課程領域的基礎知識理論	0.683
擴展自己原本專業領域以外的能力	0.668
能夠應用跨領域知識解決問題的能力	0.658
找到一個有興趣的領域	0.604
了解未來就業市場需求	0.568

㈡驗證性因素分析

為了建立研究工具的強韌性，以供不同領域研究應用，本研究再以因素驗證組樣本（N = 682）進行驗證性因素分析，更嚴謹地考驗本研究工具在理論模型及統計考驗上的效度。驗證性因素分析結果顯示，本研究所使用各量表的模型適配度指數為：$\chi^2 = 4363.26, df = 623, p < 0.001$, RMSEA = 0.094, SRMR = 0.041, CFI = 0.98, NFI = 0.97, NNFI = 0.97，符合Hu與Bentler（1999）所提之標準化殘差均方根指數（SRMR）值應小於0.08，以及黃芳銘（2006）對平均近似值誤差平方根（RMSEA）建議值應小於0.05，0.05至0.08之間為不錯的適配，0.08至0.10之間則是普通適配等標準值，意指此樣本模型適配度良好。

各題項之標準化參數估計值在0.51至0.86之間（表3），合於Hair、Black、Babin、Anderson與Tatham（2005）建議應大於0.50的門檻標準。學習能力、學習策略、學生評量教學成效、同步遠距教學、線上教材，與學生自評學習效益之組合信度分別為0.993、0.989、0.995、0.993、0.994，與0.997，符合Fornell

表3　驗證性因素分析之因素負荷量、組合信度，與平均變異抽取量

題序	學習能力	學習策略	學生評量教學成效	同步遠距教學	線上教材	學生自評學習效益
1	0.60***	0.84***	0.80***	0.81***	0.77***	0.77***
2	0.51***	0.86***	0.84***	0.83***	0.74***	0.72***
3	0.75***	0.79***	0.82***	0.80***	0.84***	0.75***
4	0.76***	0.79***	0.79***	0.82***	0.84***	0.76***
5	0.81***		0.82***	0.83***	0.83***	0.74***
6	0.74***		0.84***	0.80***	0.86***	0.71***
7	0.71***		0.76***		0.82***	0.76***
8	0.77***		0.79***			0.78***
9	0.71***		0.78***			0.80***
10						0.80***
11						0.77***
12						0.74***
13						0.78***
14						0.80***
15						0.77***
組合信度	0.993	0.989	0.995	0.993	0.994	0.997
平均變異抽取量	0.944	0.957	0.957	0.957	0.959	0.952

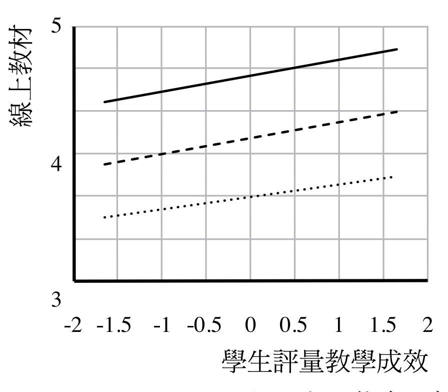
*** $p < 0.001$

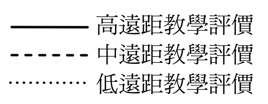
與Larcker（1981）所建議之大於0.6的標準。另平均變異抽取量（AVE）分別為0.944、0.957、0.957、0.957、0.959，與0.952，亦符合Bagozzi與Yi（1988）所建議之大於0.5的標準，因此整體信度與效度都通過考驗。

㈢ 交互效果

本研究根據文獻回顧建立研究假設，並透過LISREL 8.80統計軟體計算分析得知，學生評量教學成效與同步遠距教學之交互作用，對線上教材與學生自評學習效益的影響皆達顯著水準，也因此本研究H2獲得支持。首先，研究團隊以線上教材為Y軸（Y_1），學生評量教學成效為X軸（X），同步遠距教學為調節變項（M），由統計分析出的未標準化參數估計值來建立的模型預測，經結構方程模式分析可擷取出：$Y_1 = 4.08 + 0.10\ X + 0.63\ M + 0.04\ X \times M$的線性關係。研究團隊根據Cohen、Cohen、West與Aiken（2003）的建議，將樣本依學生對同步遠距教學的評價平均數區分為高評價（mean + 1 SD，即$m_1 = 0.728011$）、中評價（mean，即$m_2 = 0.00$）、低評價（mean – 1 SD，即$m_3 = –0.728011$）三組進行後續交互效果的斜率分析（Hayes & Matthes, 2009）。因此，可在上述線性關係中得到以下三個關係式：$Y_{11} = 4.538647 + 0.12912\ X$、$Y_{12} = 4.08 + 0.10\ X$，以及$Y_{13} = 3.621353 + 0.07088\ X$。此三個關係式即為圖1所示之線上教材與學生評量教學成效的三個線性關係。

研究團隊復以學生自評學習效益為Y軸（Y_2），學生評量教學成效為X軸（X），同步遠距教學為調節變項（M），由統計分析出的未標準化參數估計值來建立的模型預測，經結構方程模式分析可擷取出：$Y_2 = 2.65 + 0.20\ X + 0.24\ M + 0.08\ X \times M$的線性關係。研究團隊根據相同作法進行後續的斜率分析，而獲得以下三個關係式：$Y_{21} = 2.824723 + 0.25841\ X$、$Y_{22} = 2.65 + 0.20\ X$，以及$Y_{23} = 2.475277 + 0.141759\ X$，此亦即為圖2之學生自評學習效益與學生評量教學成效的三個線性關係。研究團隊根據以上分析數據，繪製以下圖1和圖2。





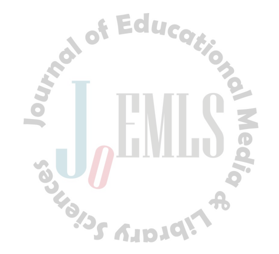



圖1 交互作用對線上教材之影響

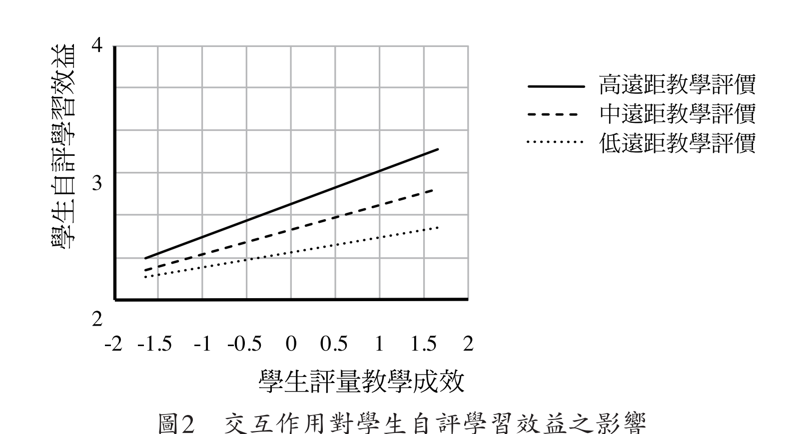


圖2　交互作用對學生自評學習效益之影響

如以上斜率分析結果顯示，無論對同步遠距教學評價的高低與否，學生對教師教學成效的評價越高，對線上教材和其學習效益的自評也會越高。此結果大抵吻合過往文獻所述（如：Guri-Rosenblit, 1999; Mackey & Freyberg, 2010; Shotsberger, 2000），本研究進一步闡明同步遠距教學與學生評量教學成效的互動，能顯著地預測工程學生透過遠距教學的自評學習效益。本研究斜率分析亦指出，對遠距教學評價高的學生，其對線上教材的評價遠高於對遠距教學評價低的學生。圖1各組的斜率相似意味著，隨著學生評量教學成效的增長，各組學生對線上教材的評價亦穩定提升。不過，從圖2的斜率表現可知，對遠距教學主觀評價高的學生，該交互作用對學生自評學習效益所產生的影響會比對遠距教學評價低的學生，產生更大的提升效果。換句話說，對遠距教學主觀評價高的學生，若選修到教學成效更好的教師所開設的課程，學生自評學習效益將會更明顯地增進。本研究不僅獲知同步遠距教學與學生評量教學成效之間會產生交互作用，更進一步點出此一交互作用特別會對遠距教學主觀評價高的學生，產生更大的學生自評學習效益。

㈣結構方程模型

本研究假設同步遠距教學與學生評量教學成效所產生的交互作用，連同學生學習能力與學習策略，透過線上教材的中介影響，能有效地預測學生自評學習效益。研究團隊採用LISREL 8.80進行結構方程模型分析，並根據Frazier、Tix與Barron（2004）的標準，驗證所假設的中介式調節模型（mediated moderation model），其初始分析獲得支持，經刪除不顯著的路徑後，重建之結構方程模型整體適配考驗結果良好（$\chi^2 = 16255.93$, $df = 4962$, $p < 0.001$, RMSEA = 0.061, SRMR = 0.043, CFI = 0.98, NFI = 0.97, NNFI = 0.98，如圖3）。因此，本研究所提H1和H3亦均獲得支持。在圖3，實線為統計達顯著水準的路徑，虛線則為統計未達顯著水準的路徑。

本研究結構方程分析結果顯示，同步遠距教學對學生自評學習效益影響最鉅（0.577，包括直接效果0.29與間接效果0.287），其次為線上教材（中介變項之直接效果0.41）、學生評量教學成效（0.231，包括直接效果0.19與間接效果0.041）、學習策略（0.096，包括直接效果0.08與間接效果0.016），與學習能力（0.036，包括直接效果0.02與間接效果0.016）。此外，學生評量教學成效與同步遠距教學的交互作用，亦會對學生自評學習效益產生顯著影響。線上教材與學生自評學習效益的解釋變異量（R^2）分別達到66%與77%。

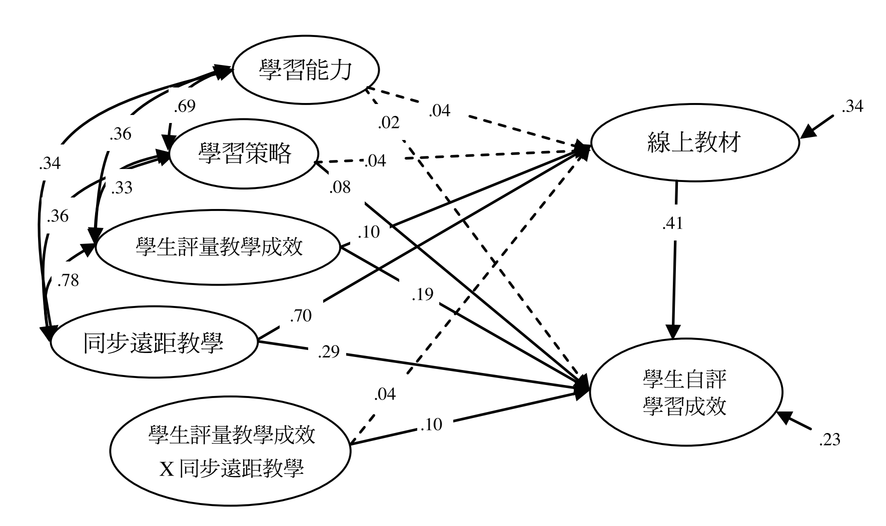


圖3　透過線上教材以預測學生自評學習效益的中介式調節模型

就此中介式調節模型的總效果而言，情境端的同步遠距教學對學生自評學習效益影響最鉅，教師端的學生評量教學成效和線上教材的影響次之，而學生端的學習能力和學習策略對其自評學習效益則影響相對有限。這意味著，在同步遠距教學環境中，決定學生自評學習效益的關鍵在情境端與教師端，包括實體與虛擬教學環境的設計和教師應用這些虛實設施的狀況，以及教師原有的教學熱忱、進度掌握、教材設計，與活動安排等。此外，本研究驗證了學生評量教學成效和同步遠距教學透過線上教材的中介會對學生自評學習效益產生良好的促發效果。這意味著，優良的數位教材設計和鼓勵學生善用數位教材都是重要的成效提升策略。這同時也意味著，過往在推動遠距教學時，資源過度偏重於軟硬體設施、網站建置，與相關軟體等設施的配置。本研究從學生觀點著眼，結果顯示出資源配置應有重新思考和規劃的空間，應更重視協助教師配合設施來設計數位教材，以及規劃鼓舞學生使用數位教材的機制和策略。尤其鼓勵學生應用這一部分，過往研究甚少細究，殊值未來深入探究與論述。

五、結論與建議

本研究首先嘗試探討SET各面向之間的關係，其次探討線上教材可能扮演之中介角色。根據研究假設整理研究結果如表4。

表4　研究假設驗證結果摘要

研究假設	驗證結果
H1：同步遠距教學可預測學生自評學習效益	支持
H2：學生評量教學成效與同步遠距教學對學生自評學習效益具有交互作用	支持
H3：線上教材可在學生學習能力和學習策略、學生評量教學成效、同步遠距教學，與學生自評學習效益之間扮演中介變項角色	支持

根據以上研究假設的驗證結果，本研究總結，在工程領域之遠距教學情境中，學生評量教學成效與同步遠距教學會產生顯著交互作用，該作用會影響線上教材與學生自評學習效益。對同步遠距教學評價高學生，該交互作用對自評學習效益的影響會比評價低學生更為明顯。本研究亦發現，在遠距教學中，決定學生自評學習效益的關鍵在學生評量教學成效、線上教材，以及同步遠距教學的品質掌控上。其中，線上教材能為各SET面向中扮演著良好中介角色，以促動學生的自評學習效益。根據研究結果，本研究建議，在建置良好的遠距教學環境中，授課教師、應妥善規劃課程內容、建置良好設計與容易操作的課程網站並提供設計良好的數位教材，以及有策略地保持與學習者的良好互動，同時鼓勵學習者複習課程和精熟學習內容，如此可幫助提升學生自評學習效益。本研究也建議，在規劃遠距教學時，投入資源可多考量配置在協助教師設計數位教材，及鼓勵學生使用數位教材上，以幫助達成實施遠距教學之整體品質與綜效。

如同其他研究一般，本研究亦有不可避免的限制。其一是本研究雖具有實證分析上的優勢，然對個別議題之深入探究便無法企求，特別是缺乏來自教師端的資訊，未來需透過更多元研究方法予以補足。其二是本研究問卷屬自陳式問項，問卷內容僅及於學生個人知覺現況之反應，受調者可能會因社會期待或心理防衛，填答反應會多所樂觀或有所保留，導致研究結果與真實狀況的落差。其三則是由於本研究實施情境為參與工程教育遠距課程聯盟之校院系所，且皆以工程為主之課程，因此部分人口變項並非完全均等，如性別以男性為主，雖符合母群之基本分佈，但研究結果不宜過度推論，需謹慎解釋。除了針對以上研究限制進行後續研究外，本研究結果也觸動了遠距教學資源最佳化配置、教師配合意願，和學生使用教材激勵策略等未來可能探索的議題，深值未來研究深入探討。在本研究中，學生學習能力或學習策略對其自評學習效益影響相對有限，亦與過往經驗相左，值得再加以深究。此外，各SET面向中扮之

間是否存在其他更複雜的交互關係，或者存在非線性效果，都需要更多學術能量的投入，方能有更完整、更深入的理解。

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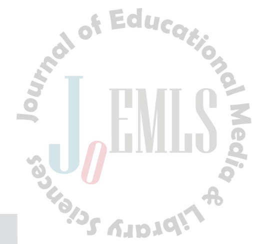
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Research Article

Integrating Considerations of Students, Teachers, and Instructional Contexts in a Predictive Model of Distance Education

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Abstract

This study examined the effects of learning ability, learning strategy, synchronism distance teaching, teaching effectiveness, and online-materials on the learning outcomes of engineering majors. The interaction between distance teaching and teaching effectiveness, as well as the mediating effects of online-materials were tested. The results indicated that the interaction between synchronism distance teaching and student evaluation of teaching effectiveness influenced online materials and student-perceived learning outcomes. The interaction effects of the group that highly valued distance instruction increased more in response to student evaluation of teaching effectiveness than did the effects of the group that valued distance instruction less. In addition, the results revealed that the quality of synchronism distance instruction, student evaluation of teaching effectiveness, and online materials are the keys to successful distance instruction. Among these critical factors, online materials played a mediating role in the relationship between the variables involved and student-perceived learning outcomes.

Keywords: *Synchronism distance-instruction, Online materials, Student-perceived learning outcome, Student evaluation of teaching effectiveness, Learning ability, Learning strategy*

SUMMARY

This study is focused on a curriculum enhancement program in engineering field, involving high-tech courses and teachers of Nanotechnology in ten universities around Taiwan. This enhancement program is about a crossing universities education through synchronous distance instruction, with digital instructional materials for students to obtain learning resources after classes and facilitate their learning. This enhancement program is also a platform for integrating learning resources from those participating universities around Taiwan, for achieving the goal of sharing resources. The factors of student evaluation of teaching (SET) investigated in this study include learning abilities and strategies, student evaluation of teaching effectiveness, distance-instruction effectiveness, online materials, and student-perceived learning outcome. The purposes of this

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research include: (1) investigating the effects of student evaluation of teaching, student evaluation of teaching effectiveness, distance-instruction effectiveness and online materials on student-perceived learning outcomes, (2) analyzing the interaction between student evaluation of teaching effectiveness and synchronous distance instruction, and (3) analyzing the possible mediating role of online materials.

In the current study, reviewed topics include the impacts of SET, teaching effectiveness, learning abilities, and learning strategies on learning outcomes, impacts of teaching effectiveness and distance instruction on learning outcomes, and relations among online materials, distance instruction, teaching effectiveness and learning outcomes. Based on the literature review, three research hypotheses are made. The questionnaire developed by Yueh et al. (2012) is adopted as the research tool, and revised according to the purposes of this study. The overall Cronbach's α is .936, and factor loadings are between .458 and .936, indicating that there is a satisfying internal consistency reliability among items of the survey. At the first stage of testing, 253 effective surveys are collected. These surveys serving as the calibration sample are analyzed using an exploratory factor analysis, for identifying appropriate factor constructs. During the second stage of testing, 682 effective surveys are obtained and used as factor authentication in a confirmatory factor analysis (CFA) for verifying the goodness of fit of factors, and for conducting an execution path analysis and building a model. After the two stages of data collection, a descriptive statistical analysis is conducted with SPSS for Windows 17.0, and LISREL 8.80 is used for structural equation modeling.

The results of the exploratory factor analysis indicate that there is a satisfying validity. The results of the confirmatory factor analysis meet the academic standards and reveal that there is a satisfying goodness-of-fit of the model. The results indicate that the interaction of student evaluation of teaching effectiveness and synchronous distance education has significant impacts on online materials and student-perceived learning outcomes, meaning the Hypothesis 2 is supported. No matter how student evaluate the synchronous distance education, there is a positive correlation between student evaluation of teaching effectiveness, and student evaluation of online materials and student-perceived learning outcomes. The results also indicate that the interaction mentioned before, together with students' learning abilities and learning strategies, through the mediating impacts of online materials, can have an effective prediction on student-perceived learning outcomes, meaning that the Hypotheses 1 and 3 are supported. The results of structural equation modeling analysis indicate that synchronous distance education has the greatest impact on student-perceived learning outcomes, following by the factors of online materials, student evaluation of teaching effectiveness, learning

strategies, and learning abilities, respectively. In addition, the interaction between student evaluation of teaching effectiveness and synchronous distance education also has a significant impact on student-perceived learning outcomes.

The conclusion of this study is that in the setting of distance education in engineering field, there is a significant interaction between student-perceived learning outcomes and synchronous distance education, and the interaction has impacts on student evaluation of online materials and student-perceived learning outcomes. For students who have a higher evaluation of synchronous distance education, there is a more significant influence on student-perceived learning outcomes, compared with students who have a lower evaluation of synchronous distance education. The results also reveal that in distance education, the key factors determining student-perceived learning outcomes are student evaluation of teaching effectiveness, online materials and the quality of synchronous distance education. Among these factors, online materials play a mediating role in factors of student evaluation of teaching (SET), and enhance student-perceived learning outcomes. Based on results, the researchers of this study suggest that in a well-built distance learning setting, teachers should design appropriate instructional materials, build learning websites with good designs and user-friendly features, provide quality digital learning materials, and maintain effective interactions with learners. Teachers should also encourage learners to review and study carefully the learning materials, for enhancing student-perceived learning outcomes. When planning distance education projects, more resources should be invested on helping teachers design digital contents and encouraging students to use digital learning resources, for achieving the overall quality and outcomes of implementing distance learning programs.

Three major limitations of this study are mentioned here. First, although this study was based on empirical analysis, it has its limits to investigate further on individual issues, especially without data or information from participating teachers. This problem can be solved by using other research methods with different perspectives. Second, the questionnaires used in this study adopt self-reported items, which only reflect student's personal perceptions of status quo; participants' answers might be exaggerated due to their awareness of social expectations or their psychological defense mechanism, failing to represent the realities. Third, since the departments and graduate schools participating in this distance learning program are in engineering fields and courses are all related to engineering, part of the demographic variables might not reflect the whole demographic truth. For example, most participating students are male, although matching the distribution of population, the results still cannot be over-generalized and should be interpreted carefully.

This study also involves issues worth investigating further in future researches, including the optimized allocation of distance learning resources, teachers' willingness to cooperate, and strategies for encouraging students to use learning materials. In this study, the impacts of students' learning abilities and strategies on student-perceived learning outcomes are relatively limited, which is a fact that differs from previous findings and worth further investigations. In addition, it is hoped that more academic efforts could be invested on a further understanding of the possible interactive and curvilinear effects among various factors of student evaluation of teaching.

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Research Article

Exploring Mathematics Teachers' Perception of Technological Pedagogical Content Knowledge

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Abstract

The purpose of the study is to develop an instrument for junior high school mathematics teachers to evaluate their technological pedagogical content knowledge. The survey tool is based on Koehler and Mishra's TPACK framework and strengthened mathematics content knowledge and pedagogical content knowledge in the framework. 526 junior high school mathematics teachers in Taiwan were recruited to validate the survey. Confirmatory factor analysis was applied to examine the validity. The results showed that survey tool reached good validly and reliability. We also explored gender, age, and seniority and other demographic factors to reflect current junior high school mathematics teachers' TPACK in Taiwan.

Keywords: *TPACK, In-service teacher, Confirmatory factor analysis*

Introduction

For decades, teaching has been considered a complex cognitive skill that requires various types of knowledge bases. Teacher educators have been exploring what teachers need to know as well as how to teach well. The basic traditional requirement for becoming a teacher is to possess plentiful content knowledge (CK) in a specialized subject matter; however, research-oriented CK has been found to be challenging for students to learn effectively. Teachers need to know how to transform the subject matter knowledge for students to understand. Shulman (1986) proposed pedagogical content knowledge (PCK) to bridge CK and teaching practice. PCK is defined as a type of knowledge that teachers develop to represent and formulate their subject matter and make it comprehensible for students (Shulman, 1986). PCK is a unique form of knowledge that distinguishes teachers from content specialists; it includes the knowledge of how subject matter can be represented, what (mis) conceptions of

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the topics can be found for learners, and how to adapt a topic for learners with diverse interests and abilities (Magnusson, Krajcik, & Borko, 1999; Shulman, 1986).

With the recent extensive use of digital technology in daily life, technology is considered an essential component for teaching support and learning in classrooms. In mathematics education, technology facilitates learners to visualize abstract ideas as well as organize and analyze data, so that learners can focus on decision-making, reflection, reasoning, and problem-solving (National Council of Teachers of Mathematics, 2000). However, studies found that teachers still lack the knowledge and skills to integrate technology in the classroom (e.g., Lee, Suharwoto, Niess, & Sadri, 2006). Researchers indicated that simply adding technological components into teaching and content domain is insufficient for technology integration; teachers need to possess technological pedagogical knowledge (TPK) to development knowledge for technology integration (Angeli & Valanides, 2009; Graham, 2011). Models and frameworks have been proposed in different disciplines, for example, information and communication (ICT)-related PCK (Angeli & Valanides, 2009) and technological content knowledge (TCK; Niess, 2005). Mishra and Koehler (2006) indicated that good teaching with technology requires understanding the combination of content, pedagogy, and technology to develop appropriate instructional strategies and representations. Mishra and Koehler (2006) adapted Shulman's PCK model and proposed a conceptual framework of Technological Pedagogical Content Knowledge (TPACK, formerly TPCK). The TPACK framework contains seven sets of knowledge [i.e., CK, PK, technological knowledge (TK), TPK, TCK, PCK, and TPACK]. This framework provides recommendations for instructional design for teacher educators in technology integration from various approaches (Graham, 2011).

A number of studies have adopted Koehler and Mishra's model to investigate teachers' TPACK, having focused mostly on pre-service teachers' development of the TPACK in teacher education programs (e.g., Chai, Koh, & Tsai, 2010; Chai, Koh, Tsai, & Tan, 2011). Other studies have explored the effects of teachers' use of specific technology and their TPACK development (e.g., Archambault & Barnett, 2010; Jang & Tsai, 2012; Lee & Tsai, 2010). However, these surveys are generic; they intended to assess teachers' TPACK for various subject areas (e.g., literature, science, and the social sciences). Although teaching various subjects requires diverse pedagogical knowledge (PK) and PCK (Koehler & Mishra, 2006; Shulman, 1986), it also necessitates different TPK, TCK, and TPACK when integrating technology into the classroom. These generic survey items may not reflect adequate professional knowledge bases. Furthermore, most TPACK studies have explored pre-service teachers' TPACK, and researchers have found that PCK

might differ between pre-service and in-service teachers (e.g., Tirosh, 2000). These study results may not have fully revealed in-service teachers' TPACK. Therefore, an investigation of in-service teachers' TPACK in a single subject may provide information on how to improve teacher professional development. The purpose of our study is twofold: (a) to develop a TPACK assessment tool for junior high school mathematics teachers; and (b) to investigate junior high school mathematics teachers' TPACK in Taiwan.

Literature Review

TPACK Framework

The traditional viewpoint of teaching decisions is made through the content; however, with the rise of technology integration in teaching and learning, the use of technology may enable or constrain teachers' use of representations or explanations regarding their subject matter (Mishra & Koehler, 2006). Within the TPACK framework, the three primary categories of knowledge, CK, PK, and TK, form a Venn diagram, which results in four more components: TPK, TCK, PCK, and TPACK. The seven categories of knowledge are defined as follows:

(a) CK is the knowledge regarding subject matter that is to be learned and taught. Specifically, it contains the concepts, principles, rules, and evidence of a subject area.

(b) PK is knowledge regarding methods, strategies, or practices that teachers have learned to teach and evaluate student learning. Here we include instructional strategies, activities, classroom management, lesson plans, and student evaluation.

(c) TK is knowledge regarding the use of digital technology. This includes the ability to operate technology, and to use software to adapt existing instructional material, or to create new ones.

(d) PCK refers to the knowledge of teaching and learning principles as well as strategies that are used to deliver content effectively. This knowledge type considers what makes concepts difficult to learn, what conceptual representations are appropriate to explain difficulties and misconceptions for learners, and what prior knowledge learners possess.

(e) TPK is knowledge regarding how different information communication technology (ICT) can be used in teaching and facilitating student learning. This includes knowledge on which ICT improves teaching effectively, and the ability to learn and adapt new ICT for teaching.

(f) TCK concerns knowledge regarding how to incorporate technology that creates better representations of specific content.

(g) TPACK is the integrative knowledge of the interaction of content, pedagogy, and technology, and includes teachers' understanding as well as the

use of technology-enhanced, content-specific pedagogical strategies for teaching subject matter and representation. Figure 1 shows the TPACK framework.

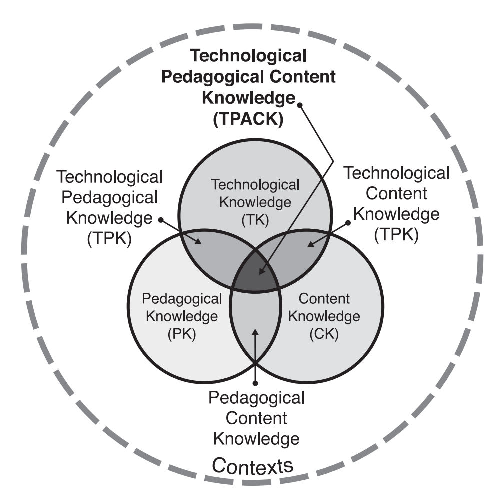


Figure 1 TPACK Framework
Source: Mishra and Koehler, 2006, p. 1025.

The Mishra and Koehler (2006) TPACK model has raised scholarly debate on how to develop teachers' knowledge bases for technology integration; yet, certain challenges and criticisms have also emerged. Angeli and Valanides (2009) argued that each component in TPACK is fuzzily defined, and researchers have a different understanding of PCK, TCK, TPK, and TPCK. In addition, the nature of TPACK is disputable regarding whether TPCK is a distinct form of knowledge or whether the changes in TPCK lead to alterations in other components within the framework (Cox & Graham, 2009; Niess, 2011). Furthermore, the relationship among the seven components is unclear (Angeli & Valanides, 2009; Archambault & Barnett, 2010; Graham, 2011), and the integrative or transformative viewpoint of the model may affect how researchers assess TPACK. Recent literature review pointed that TPACK as a distinct body of knowledge, and researchers suggested that contextualize TPACK on a specific domain may improve our understanding of TPACK (Graham, 2011; Voogt et al., 2012).

PCK and TPCK in mathematics education

Ball, Thames, and Phelps (2008) observed mathematics teachers' practice, and found that mathematics teachers need to explain the concepts, principles, and procedures, but also interpret student errors and evaluate alternative algorithms. Mathematics teachers need advanced mathematical knowledge and skill to decide whether a method or procedure works in general. These practices necessitate mathematics knowledge, which encompasses more than Shulman's definitions

of CK and PCK. Therefore, they proposed a framework of Mathematics Knowledge for Teaching (MKT) that integrated CK and PCK, and divided it into six categories. The CK domain includes common content knowledge (CCK), specialized content knowledge (SCK), and horizon content knowledge (HCK). CCK is the knowledge that one can correctly solve mathematics problems; it can be used under numerous circumstances other than in teaching. SCK refers to mathematical knowledge and skills that are specific to teaching mathematics, and HCK is defined as knowing how a specific concept is related to other concepts in mathematics curricula. Parallel to Shulman's PCK are an additional three knowledge categories: knowledge of content and students (KCS), knowledge of content and teaching (KCT) and knowledge of content and curriculum (KCC). KCS refers to the knowledge of common student conceptions and misconceptions regarding specific mathematical content, KCT is knowledge regarding what examples to use or the advantages and disadvantages of representations used to teach specific content, and KCC is knowledge regarding instructional materials and programs (Ball et al., 2008). Despite factor analysis having not empirically supported the existence of the distinct components of the MKT model (Baumert et al., 2010), this model is considered most influential, and best describes CK and PCK in mathematics education (Depaepe, Verschaffel, & Kelchtermans, 2013).

For mathematics education, Niess et al. (2009) proposed a model for preservice mathematics teachers' TPACK development. The model included standard indicators in four areas (i.e., the design and development of technology-rich learning environments, the application of methods and strategies for applying appropriate technology to maximize student learning, the application of technology to facilitate assessment, and the use of technology to enhance teachers' productivity and proactivity). This model seems generic, and does not address mathematics teaching specifically (Voogt, Fisser, Roblin, Tondeur, & van Baak, 2012). Therefore, to better assess mathematics teachers' TPACK, we developed a survey based on Mishra and Koehler's TPACK model, and expanded CK and PCK to include CCK, SCK, and KCC from MKT.

Assessment of TPACK

To investigate teachers' perceptions of TPACK, researchers have developed surveys on the basis of the Mishra and Koehler (2006) model. Some studies have explored pre-service teachers' TPACK in a generic survey (e.g., Chai et al., 2010; Schmidt et al., 2009), some have focused on in-service teachers in science education (e.g., Lee & Tsai, 2010; Lin, Tsai, Chai, & Lee, 2013), and still others have examined specific pedagogical uses of technology knowledge (e.g., Jang & Tsai, 2012). Most of these studies have used exploratory factor analysis (EFA) to examine the validity of the surveys; few studies can verify Mishra and Koehler's

(2006) seven components of the TPACK model. Schmidt et al. (2009) developed a TPACK survey tool, Survey of preservice teacher's knowledge of teaching and technology, and examined how pre-service teachers develop and apply TPACK through their teacher preparation program. Through factor analysis within each subscale, they selected 24 items, and validated the tool. The participants in that study were 124 k-6 pre-service teachers who taught all of the subjects in their classroom. The question items used to assess CK focused on the whether teachers had an in-depth and broad knowledge of the subjects, and if they knew various examples in a diverse range of subjects (i.e., math, science, social studies, and literature). Koh, Chai, and Tsai (2010) recruited 1,185 pre-service teachers to validate a TPACK survey tool. Through EFA, they found that participants were unable to distinguish between TCK and TPK. The items from TPK, TCK, and TPACK were loaded as one factor, and items from PK and PCK were loaded as another factor. The researchers renamed the five identified factors as TK, CK, knowledge of pedagogy (KP), knowledge of teaching technology (KTT), and knowledge from critical reflection (KCR).

Few studies have explored in-service teachers' TPACK. Graham et al. (2009) designed a survey to measure in-service science teachers' confidence in TPACK. This survey included 31 items to measure four components (i.e., TK, TPK, TCK, and TPACK) through 15 participant responses, and their results indicated that these in-service science teachers' confidence in TK is foundational to developing confidence in the other three forms of knowledge measured. Lin et al. (2013) investigated 222 primary and secondary school pre-service and in-service science teachers' perceptions of TPACK in Singapore. The structural equation model (SEM) analysis results confirmed the Mishra and Koehler (2006) seven-factor model. That study found that in-service teachers had significantly higher confidence compared with pre-service teachers for CK and PK.

Some survey tools have been developed to assess teachers' perceptions when they incorporate specific technology tools or instructional methods. Archambault and Barnett (2010) surveyed 1,795 k-12 online teachers' TPACK. Through factor analysis, they found three factors: PCK, TK, and TCK. CK, PK, and PCK were loaded as one factor and labeled PCK, and the items of TPK, TCK, and TPCK were loaded as TCK, with TK being the only clear factor. Lee and Tsai (2010) developed a Technological Pedagogical Content Knowledge-Web (TPCK-W) Survey to assess teachers' self-efficacy in web-based instruction. The participants were 558 teachers from select elementary schools to high schools in Taiwan. Through factor analysis, their survey identified five factors: web general, web communication, web CK, web PCK, and attitude. The results showed that web PK and web PCK were loaded as one factor. Chai et al., (2011) explored the PK

of meaningful learning and web competence. They investigated 834 pre-service teachers teaching various content areas in Singapore. The survey items included 28 items from the Schmidt et al. (2009) survey, and added meaningful learning to replace generic PK. For TK, they included web-based technology; thus, TK was measured as web competence. The factor analysis results showed five factors in the pre-course survey; this meant that teachers were able to distinguish among TK, PK, CK, TPK, and TPACK. Jang and Tsai (2012) surveyed 614 in-service elementary mathematics and science teachers in the use of interactive whiteboards (IWBs) in Taiwan. In addition to the seven categories from the TPACK framework, the survey included context knowledge (CxK), which refers to students' prior knowledge, misconceptions, learning difficulties in each subject, and an evaluation of student understanding. The TPACK questionnaire underwent factor and item analyses. The results yielded four major components: CK, TK, PCKCx, and TPCKCx. Items from PK and PCK were combined as PCKCx, whereas items from TPK, TCK, and TPCK were loaded as TPCKCx. The results showed teachers who use IWBs had significantly higher CK, PCKCx, TK, and TPACKCx compared with those who do not use IWBs. From aforementioned these studies, we found that most of them have investigated pre-service teachers' TPACK, most of survey items were content-general. As researchers pointed that TPACK needs to be contextualized on a specific lesson topic (Graham et al., 2009), it also needs to examine in-service teachers' TPACK for one specific subject. Further, most studies merely used EFA to extract factors from the framework that might not be able to address the complex nature of TPACK model (Lee & Tsai, 2010), therefore, in present paper, we adopt MKT to develop TPACK instrument and use confirmative factor analysis to verify the Mishra and Koehler (2006) seven factors of TPACK model.

Teacher's TPACK by gender and teaching experience

Previous studies have shown that males and females have different knowledge and attitude toward ICT (Kay, 2006; Markauskaite, 2006). Few studies have investigated gender differences in teachers' TPACK. Koh et al. (2010) found that male pre-service teachers' TK was higher than that of their female counterparts. Lin et al. (2013) revealed that female in-service teachers had higher confidence in PK but less confidence in CK. Jang and Tsai (2012) found that gender differences did not have any significant effects on elementary school science and math teachers' IWB-based TPACK. Later, they conducted another study to investigate 1,292 secondary science teachers in Taiwan, and found that male teachers rated themselves higher than did female teachers in TK (Jang & Tsai, 2013).

Researchers also explored other demographic factors such as age, teaching experiences (seniority), technology integration experiences, and their relationship with TPACK. Lee and Tsai (2010) conducted the correlation analysis and found that older teachers with more teaching experience were less confidence about their web-TPACK. Lin et al. (2013) also used the correlation analysis to find that in-service teachers' TK, TPK, TCK and TPC(K) were significantly correlated with their age negatively. They concluded that female in-service science teachers tended to feel less confident in technology-related knowledge base (i.e., TK, TPK, TCK and TPACK) when the age increased. Koh, Chai, and Tsai (2014) surveyed 354 elementary, secondary school and junior college teachers in Singapore. From the correlation analysis results, they found that teaching experiences had significant influence on constructivist-oriented TPACK whereas age and gender did not.

In Jang and Tsai (2012) study, experienced elementary science and mathematics teachers had higher CK, pedagogical content knowledge in context (PCKCx), and TPACK than novice teachers. In the later study, they found experienced secondary science teachers had higher rating in CK and PCKCx, while science teachers with less teaching experience had higher rating in TK and technological content knowledge in context (TPCKCx) (Jang & Tsai, 2013). Both studies used ANOVA to find the significant differences among four groups of teaching experience, however, without post hoc tests, it is unclear which group was better than others. Teacher educators have noted that teachers' needs in professional development might vary depending on their career stages (Richter, Kunter, Klusmann, Lüdtke, & Jürgen, 2011), this warrants further investigating to examine the interaction effect of gender and other demographic characters factors on secondary school mathematics teachers' TPACK.

Method

Subjects

Our study participants were public junior high school mathematics teachers in Taiwan. We recruited 526 math teachers (approximately 56% of them were men) for the study. In total, 257 participants (48.9%) were between 31 and 40 years old, 205 teachers (39.0%) were older than 40 years, and 64 teachers (12.2%) were under 30 years of age. Regarding their teaching experience, 232 teachers (44.1%) taught for 11-20 years, 210 teachers (39.9%) taught less than 10 years, and 83 teachers (15.8%) taught for more than 21 years. Concerning technology integration experience, approximately 71% of participants had experience, whereas 29% of teachers had no technology integration experience. Demographic information is listed in Table 1.

Table 1 Demographics Data of the Subjects

N=526

Item	Group	Count	Percentage (%)
Gender	Male	294	55.9
	Female	230	43.7
	missing	2	.4
Age	Under 30 yr.	64	12.2
	31-40 yr.	257	48.9
	Above 41 yr.	205	39.0
Teaching experiences	0-10 yr.	210	39.9
	11-20 yr.	232	44.1
	21-more yr.	83	15.8
	Missing	1	.2
Technology Integration Experience	Yes	374	71.1
	No	152	28.9
Total		526	100.0

Instrument development

To explore Taiwan junior high school mathematics teachers' perception of TPACK, we developed a survey for mathematics teachers (TPACK-MT). The constructs in the survey were based on the Mishra and Koehler (2006) framework containing seven subscales (i.e., CK, PK, TK, TCK, PCK, TPK, and TPACK) and existing survey tools (e.g., Chai et al., 2009; Lin et al., 2013; Schmidt et al., 2009). To better assess mathematics teachers' CK and PCK, we followed the recommendations by Ball et al. (2008), and created question items to assess math pedagogical content knowledge (PCK-M) and general pedagogical content knowledge (PCK-G). A sample question for PCK-M was, "I am able to use mathematics special knowledge to identify students' mistakes in solving math problems." A sample question for PCK-G was, "I am able to identify the rationale when students are creating new ways to solve math problems."

TPACK-MT is ranked on a 6-point scale, ranging from 1 (does not apply), 2 (applies slightly), 3 (somewhat applies), 4 (fairly applies), 5 (mostly applies), to 6 (completely applies; Graham et al., 2009). The junior high school mathematics teachers relied on their perceptions to select the most appropriate answers. The mean scores represent the level of knowledge.

We conducted the pilot test on 66 mathematics teachers from 10 schools. The number of returned responses was 63 (the return rate was 96.9%), with 62 valid for further analysis. Based on the item analysis results, we removed questions that include (a) a coefficient of skewness greater than 1 or less than –1, (b) a correlation of more than .75, (c) a subscale correlation less than .30, (d) factor loading values less than .30, or (e) a critical value (CR) that did not reach a significance of .05 (Costello & Osborne, 2005). Consequently, 35 items remained for testing.

Data analysis

To develop the reliability and validity of the TPACK-MT survey tool, we used SEM for confirmatory factor analysis. We first built an initial model on the basis of Mishra and Koehler (2006) framework. Then, we used the sample data to define the model and modified it in the light of parameter estimation results. Finally, to ensure the model stability, we used another group of sample teachers to cross-validate the model. We also used the *t* test and two-way MANOVA to explore age, teaching experience and technology integration interactions in junior high school mathematics teachers' TPACK in Taiwan.

Results

Instrument development

We followed the procedures by Lou, Lin, and Lin (2013), and employed 230 female teachers for the calibration sample and 294 male teachers for the validation sample. We used LISERL8.80 for confirmatory factor analysis, and maximum likelihood (ML) for parameter estimation to examine the validity. The observation variables numbered 35 items, and seven latent factors were for model validation.

Based on the goodness-of-fit statistics (GFI) results, the calibration sample and validation sample fitness indices were acceptable. The normed chi-square (χ^2/df) of the calibration sample was 2.33 (1218.74/524), and that of the validation sample was 2.38 (1246.46/524). When χ^2/df was between 2 and 3, the model was typically a good fit. Furthermore, according to Hu and Bentler (1999), the Comparative Fit Index (CFI) and the root mean square error of approximation (RMSEA) are required for inclusion in the description. They indicated that when the CFI is more than .90 and the RMSEA is less than.05, this means that the model has a good fit, and less than .08 means that the model has a reasonable fit. Therefore, in this study, the CFI in the calibration sample was .97, the RMSEA was .076, and the validation sample had a CFI of .98 and an RMSEA of .065, indicating that the measured model had a reasonable fit.

For cross-validation, LISERL provides an Expected Cross-Validation Index (ECVI) for measuring whether models can be used in different samples with a good fit (Browne & Cudeck, 1993). Because no fixed value exists for the ECVI, we used an independence model and a saturated model for comparison. It would be better if the EVCI is smaller than the independence model and the saturated model. The calibration sample model EVCI was 6.25, with 90% CI at (5.82, 6.71), and the independence model ECVI was 103.55, with the saturated model ECVI at 5.50. The EVCI of the calibration sample was more than that of the saturated model, but considerably less than that of the independence model. Regarding the

validation sample model, the EVCI was 4.92 with 90% CI of (4.63, 5.43), and the EVCI of the independence model and the saturated model was 110.49 and 4.30, respectively. The validation sample model EVCI was more than that of the saturated model, but less than that of the independence model; therefore, the model had acceptable cross-validity.

Table 2 shows that all of the factor loadings (standardized validity coefficients) of the observed variables to the latent variables in the calibration sample were between .48 and .97, mostly meeting the requirement (between .95 and .50), and all the *t* values were greater than 1.96. This means that each observed variable reached a significance level of .05, and that the latent factors in the calibration sample had validity. The composite reliability between .676 and .944 was more than .6 for all the variables, showing that the model had good internal quality. The average variance extracted (AVE) values were between .401 and .774, which also met the requirements.

Table 2 Validity and Reliability of Calibration Sample and Validation Sample in TPACK-MT

N=526

Item	Standardized validity coefficient		Reliability coefficient		Composite reliability		Average variance extracted	
	C	V	C	V	C	V	C	V
CK1 Understand mathematics knowledge structures and approaches	.87	.85	.76	.72				
CK2 Understand related theories and the curriculum-developing process in the junior high school mathematics curriculum	.80	.82.	.64	.67				
CK3 Understand mathematics concepts in the junior high school mathematics curriculum	.84	.89	.71	.79				
CK4 Know the Grades 1-9 Curriculum competence indicators	.63	.69	.40	.48				
					.868	.888	.625	.667
PK1 Appraise students' learning progress	.70	.67	.49	.45				
PK2 Improve student motivation	.74	.77	.55	.59				
PK3 Use appropriate instructional methods to meet different students' needs	.68	.77	.46	.59				
PK4 Adapt teaching based on what students currently understand or do not understand	.73	.76	.53	.58				
PK5 Guide students to adopt appropriate learning strategies	.75	.81	.56	.66				
PK6 Assess students' learning in multiple ways	.74	.82	.55	.67				
PK7 Evaluate students' understanding of course content	.68	.64	.46	.41				
					.881	.900	.515	.515
TK1 Use emerging technology	.67	.76	.45	.58				
TK2 Use new computer applications	.63	.69	.40	.48				
TK3 Solve my own technology problems	.51	.78	.26	.61				
TK4 Keep up with emerging technological products and knowledge	.71	.85	.50	.72				
					.726	.854	.401	.596

PCK1 Use special mathematics knowledge to identify students' mistakes in solving math problems	.69	.65	.48	.42				
PCK 2 Identify the rationale when students try new ways to solve mathematics problems	.71	.66	.50	.44				
PCK 3 Explain the rationale behind the mathematics problem-solving process for students	.83	.83	.69	.69				
PCK 4 Use appropriate examples to explain mathematical concepts	.86	.88	.74	.77				
PCK 5 Use appropriate figures and tables to explain mathematical concepts	.79	.82	.62	.67				
					.883	.881	.604	.599
TCK1 Know the problems that students might encounter when they use technology in learning	.60	.61	.36	.37				
TCK2 Use appropriate technological tools to teach mathematics, and allow students to apply mathematics knowledge in their daily life	.81	.78	.66	.61				
TCK3 Use appropriate technology and instructional methods	.79	.79	.62	.62				
TCK4 Guide students to use ICT to analyze data	.79	.83	.62	.69				
TCK5 Guide students to use ICT to construct knowledge	.87	.92	.76	.85				
TCK6 Guide students to use ICT to engage in collaborative learning	.91	.90	.83	.81				
TCK7 Guide students to use ICT to evaluate their understanding and obstacles	.90	.91	.81	.83				
TCK8 Reflect on how ICT might impact my teaching	.89	.92	.79	.85				
					.944	.929	.680	.701
TPK1 Know specific computer software to help students understand mathematical concepts (e.g., PowerPoint, GSP, drawing pad, smart board)	.72	.80	.52	.64				
TPK2 Choose e-learning materials to add in mathematics class	.48	.60	.23	.36				
TPK3 Develop or revise existing e-learning materials to fit in the national curriculum guideline	.71	.75	.50	.56				
					.676	.762	.417	.520
TPACK1 Help other mathematics teachers use ICT in their classes	.78	.83	.61	.69				
TPACK2 Integrate mathematics content, instructional methods, and technology in teaching the junior high school mathematics curriculum	.96	.96	.92	.92				
TPACK3 Combine mathematics content, instructional methods, and technology to help students learn mathematics	.97	.95	.94	.90				
TPACK4 Evaluate student learning outcomes based on mathematics content, instructional methods, and technology	.79	.81	.62	.66				
					.932	.938	.774	.791

Note: C= calibration sample, V= validation sample

Regarding the validation sample group, all of the factor loadings (standardized validity coefficients) of the observed variables to latent variables were between .60 and .96. The *t* values were more than 1.96, and reached a significance level of .05. These results show that all of the observed latent variables had good validity. The composite reliability (between .762 and .938) was higher than .7, and thus considered excellent. The AVE values in seven latent variables were between .515 and .791, which fit the requirement. In summary, both the calibration model and the validation model have a good fit, which means that the observed variables adequately reflect the latent variables. The first-order confirmatory factor analysis results are shown in Table 2.

TPACK-MT analysis

The means of the seven subscales were between 3.89 and 5.13, and the standard deviations (SD) were between .59 and .92. The descriptive statistics analysis results showed that the skewness of the seven subscales was between –.59 and –.467, and kurtosis was between –.329 and .499; thus, both fit the normal distribution hypothesis. Therefore, we used the maximum likelihood method (ML) to measure parameter estimations, and to identify the model fit for the measurement model. The descriptive statistics analysis results of the subscales and total scales are listed in Table 3.

Table 3 Descriptive Data Results of TPACK-MT Subscales

N=526

Subscale	Mean	SD	Skewness	Kurtosis
CK	5.04	.67	–.435	–.195
PK	4.88	.59	–.366	.486
TK	4.30	.92	–.336	.159
PCK	5.13	.59	–.454	–.087
TPK	3.89	.89	–.422	.499
TCK	4.29	.85	–.275	–.080
TPACK	5.05	.92	–.467	.359
Overall	4.50	.58	–.059	–.329

Internal consistency reliability

Table 4 shows the TPACK survey and the internal reliability of the seven subscales. The seven subscales' Cronbach's α values were between .77 and .955, and the overall Cronbach's α was .956. The standardized Cronbach's α values were between .771 and .955, and the overall Cronbach's α was .956. The internal validity was high, and indicated adequate internal reliability.

Table 4 TPACK Scales and 7 Subscales' Cronbach's α

N=526

Subscale	Cronbach's α	Standardized cronbach's α	Item
CK	.877	.880	4
PK	.906	.908	7
TK	.861	.869	4
PCK	.888	.890	5
TPK	.955	.955	8
TCK	.770	.771	3
TPACK	.891	.895	4
Overall	.956	.956	35

Internal consistency validity

Table 5 shows the correlation coefficient of the seven subscales and overall TPACK scales. The coefficients were between .193 and .855, and all reached significance, indicating that the survey tool has good internal validity.

Table 5 Correlation among TPACK-MT Subscales and Overall Scale

N=526

	CK	PK	TK	PCK	TPK	TCK	TPACK	Overall
CK	-	.659***	.263***	.723***	.267***	.316***	.307***	.607***
PK		-	.382***	.696***	.392***	.389***	.397***	.718***
TK			-	.280***	.661***	.652***	.613***	.759***
PCK				-	.193***	.296***	.219***	.577***
TPK					-	.731***	.821***	.855***
TCK						-	.791***	.808***
TPACK							-	.833***

***$p<.001$

The results of TPACK, TPK and TCK subscales were highly correlated; there might be some concerns about multicollinearity. To avoid the multicollinearity problem, we can use composite reliability to assess the fitness of the calibration model. Fornell and Larcker (1981) suggested that when the composite reliability is more than .6, the observed variables can reflect latent variables. The composite reliability of latent variables in this study were more than .6, which means that latent variables have high correlations, and did not affect the fitness of model.

Gender and age effects on mathematics teachers' TPACK

We employed two-way MANOVA to analyze the effects of gender and age on mathematics teachers' TPACK. The results showed that no significant interactive effect exists, but the main effects of gender and age were significant. Gender effects yielded significant differences on TK (F=5.20, p=.010), and showed that male teachers' TK scored higher than that of female teachers. Regarding age, five subscales and overall scales (F=6.077, p=.002) had significant

differences. The five subscales were CK (F=3.916, p=.021), TK (F=14.796, p=.000), TPK (F=5.430, p=.005), TCK (F=7.556, p=.001), and TPACK (F=7.482, p=.001). The post hoc results of each subscale and overall scale are shown in Table 6. We found that male mathematics teachers had a higher TK score, and teachers who were younger than 30 years had a higher score in TK, TPK, TCK and TPACK.

Table 6 MANOVA Results of Subscales and Overall Scale in Gender*Age

N=524

Independent var.	Dependent var.	*df*	*F*	*p*	η^2	*Post Hoc*
gender	CK	1	.299	.585	.001	-
	PK	1	.139	.709	.000	-
	TK	1	5.200^{*}	.023	.010	male>female
	PCK	1	.018	.894	.000	-
	TPK	1	.821	.365	.002	-
	TCK	1	1.697	.193	.003	-
	TPACK	1	.508	.476	.001	-
	overall	1	1.412	.235	.003	-
age	CK	2	3.916^{*}	.021	.015	above 41yr.>31-40yr.
	PK	2	1.378	.253	.005	-
	TK	2	14.796^{***}	.000	.054	under 30yr.>31-40yr.> above 41yr.
	PCK	2	.440	.645	.002	-
	TPK	2	5.430^{**}	.005	.021	under 30yr.>31-40yr. under 30yr.>above 41yr.
	TCK	2	7.556^{**}	.001	.028	under 30yr.>31-40yr> above 41yr
	TPACK	2	7.482^{**}	.001	.028	under 30 yr >31-40yr under 30yr.>above 41yr
	overall	2	6.077^{**}	.002	.023	under 30yr.>31-40yr. under 30yr.>above 41yr.
gender *age	CK	2	.936	.393	.004	-
	PK	2	1.070	.344	.004	-
	TK	2	.024	.976	.000	-
	PCK	2	.961	.383	.004	-
	TPK	2	1.744	.176	.007	-
	TCK	2	1.013	.364	.004	-
	TPACK	2	2.583	.077	.010	-
	overall	2	1.786	.169	.007	-

$^{*}p<.05$, $^{**}p<.01$, $^{***}p<.001$

Gender and seniority effects on math teachers' TPACK

The two-way MANOVA results showed that no significant interaction effect exists, but the main effects of gender and teaching experience were significant. Gender effects were found on TK (F=7.338, p=.007), TPK (F=5.484, p=.020), TCK (F=4.134, p=.043), TPACK (F=6.884, p=.009), and the overall scale (F=6.119, p=.014). Male mathematics teachers had higher scores than their female counterparts on the four technology-related subscales and the overall

scale. Regarding teaching experience, all seven subscales, CK (F=5.041, p=.007), PK (F=4.453, p=.012), TK (F=15.576, p=.000), PCK (F=6.356, p=.002), TPK (F=6.407, p=.002), TCK (F=12.212, p=.000), and TPACK (F=7.214, p=.001), as well as the overall scale (F=6.474, p=.002), had significant differences. From the post hoc test, we found that mathematics teachers with less than 10 years of teaching experience had a higher score in all four technology related subscales and overall scale. Teacher with more than 21 years teaching experiences had highest score in CK, and lowest scores in TK, TCK and TPACK. The post hoc test results of each subscale and the overall scale are shown in Table 7.

Table 7 MANOVA Results of Subscales and Overall Scale in Gender* Teaching Experience

N=524

Independent var.	Dependent var.	*df*	*F*	*p*	η^2	*Post Hoc*
gender	CK	1	1.234	.267	.002	-
	PK	1	1.293	.256	.002	-
	TK	1	7.338*	.007	.014	male>female
	PCK	1	.164	.685	.000	-
	TPK	1	5.484*	.020	.010	male>female
	TCK	1	4.134*	.043	.008	male>female
	TPACK	1	6.884**	.009	.013	male>female
	overall	1	6.119*	.014	.012	male>female
teaching experiences	CK	2	5.041**	.007	.019	above 21yr.> 0-10yr. above 21yr.>11-20yr.
	PK	2	4.453*	.012	.017	above 21yr.> 11-20yr.
	TK	2	15.576***	.000	.057	0-10yr.> 11-20yr. 0-10yr.> above 21yr.
	PCK	2	6.356**	.002	.024	above 21yr.> 11-20yr.
	TPK	2	6.407**	.002	.024	0-10yr.> 11-20yr. 0-10yr.> above 21yr.
	TCK	2	12.212***	.000	.045	0-10yr.> 11-20yr. 0-10yr.> above 21yr.
	TPACK	2	7.214**	.001	.027	0-10yr.> 11-20yr. 0-10yr.> above 21yr.
	overall	2	6.474**	.002	.024	0-10yr.>11-20yr. 0-10yr.> above 21yr.
gender * teaching experiences	CK	2	.987	.373	.004	-
	PK	2	.289	.749	.001	-
	TK	2	1.111	.330	.004	-
	PCK	2	.799	.450	.003	-
	TPK	2	.770	.464	.003	-
	TCK	2	2.552	.079	.010	-
	TPACK	2	1.108	.331	.004	-
	overall	2	1.337	.263	.005	-

*p<.05, **p<.01, ***p<.001

Gender and technology effects on mathematics teachers' TPACK

Regarding the interaction between gender and technology integration, the two-way MANOVA results showed that PCK (F=4.122, p=.043), TCK

(F=6.818, p=.009), and the overall scale (F=3.903, p=.049) had a significant interactive effect, as shown in Table 8. Therefore, we further examined the simple main effects of gender and technology integration. Table 9 shows that male mathematics teachers' TCK (F=54.620, p=.000) and the overall scale (F=22.239, p=.000) had significant differences (Will's Λ=.835, p=.000). This means that male teachers with technology integration experience had higher TCK and overall scale scores than those with no technology integration experience. For female mathematics teachers Will's Λ=.893 (p=.000), PCK (F=4.749, p=.030), TCK (F=12.939, p=.000), and the overall scale (F=4.189, p=.042) had significant differences. The post hoc test results show that female teachers with technology integration experience had higher scores than those without technology integration experience in TCK and the overall scale. Yet, female teachers with no technology integration experience had a higher score than those who had technology integration experience in the PCK subscale.

Regarding technology integration experiences, PCK (F=4.029, p=.045), TCK (F=7.842, p=.005), and the overall scale (F=8.008, p=.005) had significant differences (Will's Λ=.976, p=.029), and male mathematics teachers had higher scores than their female counterparts. For teachers with no technology integration experiences, PCK, TCK, and the overall scale did not yield significant differences.

Table 8 Two-way MANOVA Results of Seven Subscales and Overall Scale in Gender* Technology Integration

N=524

Independent var.	Dependent var.	df	F	p	η^2
gender * technology integration	CK	1	.996	.319	.002
	PK	1	.961	.327	.002
	TK	1	.749	.387	.001
	PCK	1	4.122^{**}	.043	.008
	TPK	1	3.223	.073	.006
	TCK	1	6.818^{***}	.009	.013
	TPACK	1	1.673	.196	.003
	overall	1	3.903^{*}	.049	.007

$^{*}p$<.05, $^{**}p$<.01, $^{***}p$<.001

Table 9 Simple Main Effect Results of Seven Subscales and Overall Scale in Gender* Technology Integration

source	df	Λ	F		
			PCK	TCK	overall
technology integration					
In male	1	$.835^{***}$	.594	54.620^{***}	22.239^{***}
In female	1	$.893^{***}$	4.749^{*}	12.939^{***}	4.189^{*}
gender					
In with	1	$.976^{*}$	4.029^{*}	7.842^{**}	8.008^{**}
In without	1	.969	1.249	1.559	0.272

$^{*}p$<.05, $^{**}p$<.01, $^{***}p$<.001

Discussion

Validity and reliability of TPACK-MT

The TPACK framework has been discussed for many years; considerable effort has been devoted to improving teachers' TPACK. For our study, we developed a TPACK survey for junior high school mathematics teachers. We designed TPACK-MT based on Mishra and Koehler's (2006) TPACK framework, and derived seven subscales totaling 35 items. The mean scores of all the subscales were between 3.89 and 5.13, and the SD were between .59 and .92. The instrument has good internal validity and reliability. Furthermore, we used a calibration sample for first-order confirmatory factor analysis, and the results showed that the composite reliability of the seven-factor model were between .676 and .944, with all values larger than .6. This means that the observed variables reflect latent variables, and have excellent reliability. In addition, we used a validation sample to examine all the indices for goodness of fit. The developed survey tool fits Mishra and Koehler's (2006) seven-factor TPACK model, and has been verified for validity and reliability. The study results are consistent with Lin et al. (2013) study and supported the seven-factor TPACK model. Previous studies focused on the pre-service teachers' TPACK, most survey items were general to all subjects, and some of factors (e.g. TPK, TCK) might not be distinguished by preservice teachers (Chai et al., 2011; Koh et al., 2010). This finding also supported the viewpoint of contextualized TPACK in a particular lesson topic and instructional activities (Cox & Graham, 2009).

Mathematics teacher's TPACK

The MANOVA results showed that male teachers scored higher in TK, TPK, TCK, and TPACK compared with female teachers. In addition, male teachers with experience in technology integration had higher PK and TCK scores than their female counterparts with experience in technology integration. The study results are consistent with previous studies that have shown that female teachers had lower TK scores than male teachers (e.g., Koh et al., 2010; Lin et al., 2013). Several studies found that female teachers were less confident to use ICT in learning and teaching and tend to indicate little or some confidence when self-check ICT competence compared to male teachers (e.g., Jamieson-Proctor, Burnett, Finger, & Watson, 2006).

Regarding age differences, we found that teachers under 30 years of age had higher TK, TPK, TCK, and TPACK scores than other groups. Similar results were also found in seniority. Novice teachers with less than 10 years of teaching experience had highest scores on the four technology-related knowledge bases (i.e., TK, TCK, TPK and TPACK) than other groups. Experienced teachers with

21 years or more of teaching experience had lower scores on four technology related knowledge, but had higher CK, PK, and PCK scores than other groups. This result is consistent with Lin et al. (2013), and Jang and Tsai (2012) that experiences had negative correlation with teachers' TPACK.

The results show that young teachers were more familiar with technology use in teaching and learning. Another possible reason is that experienced teachers who are more familiar with subject content and student needs might consider technology integration to be a pedagogical strategy (Graham, 2011; Shulman, 1986). Whereas the educational goals in junior high school mathematics emphasize the representation of abstract concepts, other concrete hands-on models are available for students to observe and manipulate physically; technology might not be the only path to attaining goals. Therefore, experienced teachers might not pay particular attention to emerging technologies and related knowledge.

Conclusion and Implication

In this study, we developed and validated an instrument, TPACK-MT, to assess in-service mathematics teachers' technological pedagogical content knowledge. From the CFA results, the instrument showed good validity and reliability of the TPACK-MT, hence, it supported the Mishra and Koehler's (2006) seven-factor model of TPACK. This instrument could be further used to assess both pre-service and in-service mathematics teachers' TPACK, and help teacher educators to develop professional development programs for mathematics teachers.

The survey results show the female teachers rated lower confidence in TK, TPK, TCK and TPACK. It is suggested that female teachers need more opportunities to explore technology-related activities. Teacher educators could organize workshops or professional communities for female teachers to share knowledge and practice on content-general technology (TK), content-specific technology (TCK), or pedagogical-general technology (TPK). Eventually, female teachers could increase their confidence on technology-related knowledge and improve their TPACK as well.

We also found that novice teachers with 10 year or less teaching experiences had higher technology-related knowledge, while experienced teachers with 21 or more years had lower technology-related knowledge. It is suggested that teacher educators and authorities may provide diverse professional development opportunities, including formal and informal support for teachers in different career stages. Researchers found that beginning teachers might need informal professional development opportunities, such as collaborations with other teachers, the exchange of ideas, and opportunities to observe other classrooms,

while mid-career teachers may incline to formal learning opportunities, such as institutions providing training programs (Richter et al., 2011). Teachers in different stages might be benefit from diverse professional develop programs. Further studies maybe explore teachers' orientation and TPACK changes over career stages.

The purpose of the study is to develop and validate a TPACK assessment instrument for junior high school mathematics teachers. It is hoped that results of this study could shed light on our understanding of in-service mathematics teachers' technological pedagogical content knowledge with the ultimate aim of improving mathematics teachers' technology integration. Future studies may explore teachers' beliefs, ICT practices and contexts when developing teachers' TPACK.

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研究論文

國中數學教師科技學科知識之探究

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摘要

本研究目的旨在發展評量國中數學教師科技學科知識（TPACK）之工具，量表架構乃根據Mishra和Koehler（2006）所提出之科技學科知識模式，此理論模式著重於國中數學教師之學科與教學知識論述。本研究調查台灣526位國中數學教師，以驗證性因素分析建立量表之信度與效度，利用建模樣本（N=230）評鑑測量模式是否與實徵資料相互適配，再以驗證樣本（N=294）驗證其模式之適配性；根據驗證性因素分析結果顯示模式適配度良好，確認本研究模式的確具有良好信效度。另又以多變量變異數分析探討國中數學教師在性別、年齡、年資及科技使用在科技學科知識的差異，文末就量表編製之結果及未來研究方向提出建議。

關鍵詞：科技學科知識，國中數學，驗證性因素分析



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啟蒙思潮下的蒙古族出版文化：1918年至1944年

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摘要

蒙古族出版事業始於13世紀，經過幾百年的艱難歷程，到19世紀迎來了其成長期。民國時期是蒙古族出版史上一個輝煌的時期。1918年到1944年間，以北京、張家口、厚和、奉天、新京、開魯為出版基地，相繼誕生了十幾家現代意義上的蒙古族出版機構。民國時期的蒙古族出版機構是當時蒙古族啟蒙思潮的產物。北京蒙文書社、東蒙書局、開魯蒙文學會等出版機構的誕生解構了蒙古社會傳統文化內部結構，對蒙古族文化史帶來了極其深遠的影響。他們在當時人力財力極度匱乏的情況下克服困難，收集古籍文獻、出版現代圖書、主辦各種雜誌、編寫蒙文教材、創辦各級學校，為蒙古地區文化的普及、思想的開明、社會的進步做出了巨大的貢獻。

關鍵詞：啟蒙思潮，蒙古族出版，出版文化，知識份子，知識傳播

前　言

經過八百年的發展歷程，到20世紀初期（1918~1944）蒙古族出版迎來了其現代化的進程。蒙古文活鉛字的發明、出版文化體系中知識份子群體的誕生、以「啟蒙」為主題知識文化的傳播，這些新生事物的不斷出現，無疑對蒙古族出版現代化的進程起到了促進作用。終結宗教出版對出版領域的長期壟斷，興辦多元化新型民營出版是這時期蒙古族出版的一大亮點。宗教出版是藏傳佛教在蒙古地區傳播的產物。蒙古族與藏傳佛教的接觸最早是在成吉思汗時期。1260年，忽必烈稱汗于開平後大力扶植喇嘛教，封八思巴為國師並「授以玉印，任中原法主，統天下教門」。[1] 王室的鼎力扶持對佛教在蒙古地區廣泛傳播鋪平了道路。13世紀末，藏傳佛教和雕版印刷術同時傳入蒙古高原，開啟了蒙

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古族出版文化的艱難歷程。在漫長的幾百年中，由於寺院印刷掌控了印刷術，所以包括歷史經典在內的世俗書籍的「出版」只能用手抄來完成。宗教出版高於世俗出版的這種局面直到民國時期才有了根本的改觀。

民國時期是中國社會的大變革時代，也是蒙古社會的大變革時代。受內地啟蒙思想和救亡運動的影響，蒙古族有識之士開始意識到蒙古社會的變革之必要。在啟蒙思想萌動的歷史條件下「研究蒙古文化，吸納先進思想，統一學術觀點，開明民族智慧，弘揚民族文化」。[2] 這一課題，得到當時蒙古族先進知識份子的普遍認同。紙質出版品作為重要的傳播媒介，在這一時期對啟蒙思想傳播和蒙古社會的變革發揮了重要作用。

1918年，第一家現代意義上的蒙古族出版機構——蒙漢翻譯國光書社創立。1918~1944年間，以內蒙古地區為中心，在北京、呼和浩特（厚和）、張家口、開魯、瀋陽（奉天）、長春（新京）等地先後出現了北京蒙文書社、奉天東蒙書社、開魯蒙文學會、察哈爾蒙文編修所、張家口德王印書館、新京蒙文會館、新京蒙文編譯所、厚和蒙古文化研究所等出版文化機構，為現代知識文化的傳播和蒙古地區的復興做出了應有的貢獻。民國時期大多蒙古族出版機構除了主營出版事業以外，還兼營學校、圖書館和學術研究等文化事業，所以它的文化特徵是很突顯的。蒙古文活鉛字的誕生、各類學校教材建設的需要、啟蒙思潮的傳播，決定了民國時期蒙古族出版事業民俗化的文化特徵和其多元化的發展趨勢。

民國時期蒙古族出版只存在短短的二十七年。但由於民國時期蒙古族出版是個特殊時代特殊環境的產物，所以這個領域的研究對蒙古族出版文化的挖掘和出版史的建構都具有現實意義。

二、前人研究評述

在蒙古學研究領域，關於民國時期蒙古族出版的研究始於20世紀60年代。1941年德國蒙古學學者瓦爾特．海西希造訪開魯蒙文學會創始人布和克什克，並在其1964年撰寫的*蒙古歷史與文化*中介紹了布和克什克的生平和出版活動。[3] 可以說瓦爾特．海西希開啟了布和克什克與蒙文學會研究，乃至民國時期蒙古族出版研究領域。但由於種種原因，瓦爾特．海西希的研究沒有足夠引起當時學界的關注。

20世紀80年代，*蒙古語文*雜誌相繼刊登了納古單夫的論文「蒙古文鉛字印刷術發明人特木格圖（1887~1939）」，額爾敦陶格濤的論文「蒙古文化功臣——克興額（1889~1950）」，「蒙古族啟蒙思想家——羅日格爾棨布（1888~1941）」，對北京蒙文書社創始人特木格圖、東濛濛文書社創始人克興額、開魯蒙文學會顧問羅日格爾棨布的生平、出版活動和出版思想等做了詳細的介紹。[4] 北京蒙

文書社、東濛濛文書社、開魯蒙文學會在民國時期蒙古族出版文化機構中最具代表性。他們所提倡的「文化救民族」之理念，所追求的「但願與志同道合者並肩，出資創立小型石印書社，編譯出版中外新舊書籍，捐給渴望知識的求學兒童，消除其無書可讀的煩惱」、「吸納先進思想，統一學術觀點，開明民族智慧，弘揚民族文化」之出版理想。[5] 在很大程度上體現了當時蒙古族先進知識份子的文化理想和精神追求。從額爾敦陶格濤、納古單夫等人所撰寫的論文中我們能夠依稀看到民國時期蒙古族出版人的活動軌跡和出版機構的發展輪廓。

到20世紀90年代前後，在蒙古學研究領域開展了一次圍繞民國時期蒙古族出版人物收集第一手資料的活動。由內蒙古各級出版社出版的特木格圖傳、布和克什克與蒙文學會、克興額——一個科爾沁蒙古人等傳記性文獻的誕生便是這次活動的一大收穫。[6] 這些文獻具有以下特點：㈠口述性。文獻的誕生均得到了歷史人物直系親戚提供的口述資料。如，額爾德木圖、寶音陶格陶撰寫布和克什克與蒙文學會時專訪布和克什克的六弟梁溫度日夫和其女兒那順格日勒，從他們的口述中提煉了大量的珍貴資料。克興額——一個科爾沁蒙古人更是克興額女兒莫日根口述的直接產物；㈡傳記性。文獻大多運用傳紀寫作手法介紹特木格圖、克興額、布和克什克等人的童年遭遇、家境狀況、求學道路、事業追求和思想境界等其成長為蒙古族啟蒙思想家的歷程；㈢全面性。文獻在突顯特木格圖、克興額、布和克什克等人文學家、教育家、社會活動家等身份的同時，也展現了他們作為出版家對蒙古族出版事業所做出的貢獻。這些文獻的搶救性收集和整理，無疑對民國時期蒙古族出版全面和系統研究提供了第一手資料。

縱覽近幾十年的民國時期蒙古族出版研究，我們不難看出這些研究成果只停留於資料建設、傳記介紹和簡單評述的層面，而很少能夠涉及到出版性質、規律、特徵等其本質性的問題。從20世紀90年代末開始，在內蒙古地區的一些大學開設編輯出版學專業並招收蒙古族出版史研究方向的研究生。新生力量的誕生在很大程度上啟動研究團隊，為蒙古族出版事業進行出版學研究提供了人才支援和研究方法。特木格圖與北京蒙文書社、東蒙書社與近代蒙古族教育事業、蒙文學會編輯出版活動之初探、民國時期張家口地區蒙古族出版事業等研究生畢業論文的寫作無疑證明了這一點。

本文在前期研究的基礎上，對民國時期蒙古族出版進行出版學研究，力爭發現民國時期蒙古族出版業的發展規律、所屬性質和經營特徵。

三、啟蒙思潮與蒙古族出版機構

中華民國時期是蒙古族出版史上一個輝煌的時期。1918年到1944年間，以北京、張家口、呼和浩特、奉天、新京、開魯為出版基地，相繼誕生了蒙

漢翻譯國光書社、北京蒙文書社、東蒙書局和開魯蒙文學會等在近代文化史上較有影響力的出版機構，為新文化在蒙古地區的傳播做出了貢獻。民國時期的蒙古族出版機構是當時蒙古族啟蒙思潮的產物，這些出版機構有的只存在了兩年，有的卻艱難跋涉了二十餘載。雖然命運不同，但是傳播知識文化、啟蒙蒙古大眾是它們共同追求的文化理想。它們用孜孜不倦的努力在近代蒙古社會和文化的結構中，催生出了現代意義上的出版機構。

蒙古族出版事業始於13世紀，經過幾百年的艱難歷程，到19世紀迎來了其成長期。從18世紀末到20世紀初，在蒙古族出版事業史上出現了官方出版機構、寺院出版機構、刻書坊「三足鼎立」的現象。以北京故宮武英殿為代表的官方印刷出版機構、以北京琉璃廠為代表的私人印刷出版機構、以北京嵩祝寺為代表的寺院印刷出版等機構堅持蒙古文出版活動，出版了大量有關語言、歷史、文學、風俗、醫學、教育等內容的書籍。「武英殿是清朝唯一的中央出版機構，『欽定』、『御制』的歷代官刻本都統一由這裡編輯、出版、發行。……在武英殿刻印的蒙文圖書中，出版意義重大、影響深遠的有康熙御制漢曆大全蒙譯本（1712）、御制清文鑒（1717）、御制滿蒙古文鑒（1743）、欽定西域同文制（1763）、欽定御制滿漢蒙古西番合璧大藏全咒（1773）、欽定蒙古源流（1777）、御制滿珠蒙古漢字三合切音清文鑒（1780）、欽定外藩蒙古回部王公表傳（1795）、欽定理藩院則例（1818）等，內容涉及曆書、語言文字、政書、史書」。[7] 位於北京城地安門三眼井東口外的嵩祝寺，其「蒙古文圖書出版延續了近200年。……清代是嵩祝寺蒙古文出版業最為興隆時期。清代所出版220種蒙古文圖書的大部分都由嵩祝寺木刻出版。其代表性的出版物有宗喀巴傳、章嘉呼圖克圖傳、故事之海、瑪尼坎寶年、聖般若波羅密多八千頌等經書」。[8] 蒙古文私人刻書始於蒙古帝國時期，在清代以後發展成一定規模，其中北京琉璃廠是當時私人刻坊彙聚地。「琉璃廠炳蔚堂、文光堂、天繪閣、英華堂、隆福寺聚珍堂、文盛堂，多出滿文書。文萃堂有新刻買賣蒙古同文雜字」。[9] 還有「老二酉堂、三槐堂等刻書坊出版有四書、滿蒙合璧三字經等蒙文圖書」。[10] 綜上所述，可以結論18世紀末到20世紀初蒙古族傳統出版業已初具規模。但是，近代蒙古族出版事業並沒有直接脫胎於傳統出版的內部結構，而誕生於在內地新文化影響下掀起的蒙古社會的啟蒙思潮中。

蒙古社會的啟蒙思潮興起於20世紀初期。它是一次以宣導文化、開啟民智的思想運動。蒙古社會啟蒙思潮的興起深受西方和內地啟蒙運動的影響。「清末民初，西方的思潮和中國社會運動第一次使蒙古地方精英覺醒，激發了開創、自覺的意識以及社會使命感」。[11]「20世紀20年代革命的啟蒙話語開始影響蒙古社會。30年代之後蒙古族開明人士主張以通過引進先進文化來啟蒙蒙古大眾。……當時布和克什克、賽興嘎等先進知識份子所提出的『開放』、『引進』的

主張無疑受到陳獨秀、魯迅新文化思想的影響。毋庸置疑，20世紀初在蒙古社會興起的宣導民主、科學、教育的啟蒙思潮與在內地發軔的新文化運動有著直接關係」。[12]

內蒙古卓索圖盟喀喇沁右旗世襲劄薩克親王貢桑諾爾布（1872~1931）是蒙古地區第一位啟蒙思想家，他從1901年起，在內蒙古東部地區興辦教育、郵政、工廠、新聞、出版事業，拉開了近代蒙古社會革新的帷幕。1902至1903年間，他創辦「崇正學堂」、「毓正女子學堂」、「守正武學堂」等學校，從中選拔優秀學生派往國外學習，其中就有特睦格圖和伊德欽、恩和布林、金永昌等優秀的蒙古族知識份子。特睦格圖（1887~1939）於1922年發明了蒙文鉛字活版印刷術。後來，他和色冷冬日布、照德寶紮布、克興額、布和克什克、羅日格爾紮布、賽興嘎等人一起高舉「文化救民族」的旗幟，成為了憂國憂民的民族啟蒙思潮的先鋒。他們所創辦的蒙漢翻譯國光書社、北京蒙文書社、東蒙書局、開魯蒙文學會、察哈爾蒙文圖書編譯室、首席官府印刷所、新京蒙文編譯室、厚和（今呼和浩特）蒙古文化研究所等出版文化機構。他們在當時人力財力極度匱乏的情況下克服困難，收集古籍文獻、出版現代圖書、編輯各種雜誌、編寫蒙文教材、創辦各級學校，為蒙古地區文化的普及、思想的開明、社會的進步做出了巨大的貢獻。

蒙漢翻譯國光書社創立於1918年，是社會各界合資的「出版公司」。創始人色冷冬日布（1872~1949）是內蒙古太僕寺人。現在已無法考證蒙漢翻譯國光書社所存在的年份。但該書社在短短幾年裡，以「介紹內地先進文化，改變蒙古地區落後面貌」為辦社理念，出版了蒙漢合璧二十四孝經、蒙漢合璧兒童讀物、蒙漢合璧國文教科書等教科書，結束了內蒙古西部地區無蒙古文教科書的歷史。[13]

北京蒙文書社是在中國歷史上第一個在北京創辦的蒙古文出版社。1924年由蒙古文活版印刷術發明人特睦格圖創辦。1914年特睦格圖從日本回國後，開始在北京蒙藏事務局工作，任首席翻譯官兼庶務科科長。期間，在時任蒙藏事務局總裁貢桑諾爾布的影響下他接觸了民主啟蒙思想，萌生了「研製蒙文鉛字，開辦蒙文書社，為蒙古地區普及教育，開啟民智貢獻微薄之力」的思想。[14] 1915年，特睦格圖對中外鉛印工藝、字形作了細緻研究後，首先將蒙文、滿文上中下三體400餘字母、字頭，書寫成工整的正楷字，用牛角刻出了85個字形。但應用於印刷時，未獲成功。1919年在貢桑諾爾布的資助下初步製成了蒙文鉛字銅模，鑄出了鉛字。1922年，蒙文鉛字印刷術終於在中國首獲成功，結束了蒙古文版刻印刷和石印的歷史。1924年，特睦格圖創辦北京蒙文書社後把蒙文鉛字印刷術用於出版實踐獲得了極大的成功。據「特睦格圖與北京蒙文書社」一文記載，「1925年，上海商務印書館聘也曾請蒙文書社技術員印刷

蒙文書籍」。[15] 從1922年到1929年是蒙文書社的鼎盛時期，由特睦格圖主編、翻譯、出版蒙、滿、漢、藏文歷史和現代書籍多達50餘種，10萬冊以上。這些圖書在國內及日、俄、法國廣為發行。其中蒙日語會話、蒙文教科書（8冊）成為其他民族學習蒙古語的入門書籍而受到好評。特睦格圖發明的蒙文鉛字活版印刷術後來廣泛用於蒙古文書籍的印刷，很大程度上提高了圖書印刷的數量和品質。

東蒙書局的創始人克興額（1889~1950）是東蒙傑出的教育家和出版家。1926年他在羅日格爾紮布的幫助下集資創立了奉天東蒙書局。他在「東蒙書局報告書」中寫道：「鄙人雖無喚醒民族、振興文化、效力政治之能力，但願與志同道合者並肩，出資創立小型石印書社，編譯出版中外新舊書籍，捐給渴望知識的求學兒童，消除其無書可讀的煩惱。這對整個社會的發展來說可能是微不足道的事情，但也能對民族教育事業的發展起到添磚加瓦的作用」。[16] 在這宗旨的指導下，經過幾年的努力東蒙書社最終編輯審定了具有民族和地方特點的初學國文（6冊）。同時也出版了蒙古族「文化啟蒙」所需要的有關蒙古族歷史、蒙古族風俗、蒙古族文學等方面的圖書30餘種。東蒙書局充分認識到出版的教育功能，把出版作為一種開民智，圖興旺的大事業，並為之奮鬥，對民族教育的發展，蒙語教科書的現代化及新思想新知識的傳播做出了貢獻。

蒙文學會於1926年在北京創立，1935年遷址內蒙古開魯。蒙文學會的成立，是蒙古族現代文化史上的一件大事。他的成立順應了蒙古地區新民主主義革命的需要。而當時的北平已成為全國新文化運動的中心。1926年1月23日，在北平城宣武門內國策大街大眾公寓10房間裡召開了蒙文學會成立首屆全體會議，並通過了「蒙文學會章程」。「章程」規定「本學會以研究蒙古文化，吸納先進思想，統一學術觀點，開明民族智慧，弘揚民族文化為宗旨」。會議上布和克什克被推選為學會會長。[17] 他是一名最早覺醒的蒙古族知識份子之一。「布和克什克十八歲那年，即1919年在全國掀起了『五－四』新文化運動，揭開了我國新民主主義革命的序幕，……1923年，布和克什克到北平考入私立俄文大學主修法學。……在北平學習期間，布和克什克受社會思潮的影響，開始結識先進知識份子，積極參與革命活動，成為一名憂國憂民的啟蒙思想家」。[18] 蒙文學會遷址開魯後，布和克什克以「蒙文學會」的名義成立出版社，完成了漢語音譯版本蒙古秘史的漢譯蒙、注釋、出版工作。在蒙古族出版史上這是一項重要的文化工程。1935年以後，蒙文學會在經費短缺的情況下多方籌集資金陸續出版了蒙古源流、青史演義、一層樓、泣紅亭、視察日本教育日記、貓探、成吉思汗頌辭、水滸傳、保產大成、簡明曆書、蒙古古今故事、新詞典等蒙文書籍。同時，在學會學術期刊丙寅雜誌上發表蒙、漢、日文千餘新名詞術語，規範了翻譯工作。蒙文學會在開魯還開辦了「蒙文學會附設補習學校」

和「蒙古民眾講習所」，成立「開魯第一國民高等學校」和「開魯第二國民高等學校」，招收蒙古族學生傳授知識文化。這幾所學校1945年8月停辦，先後培養上千名中級人才。在近代蒙古族出版史上，蒙文學會生存的時間最長，完成的工作最多。布和克什克認為：「每一個要使自己民族和國家強盛起來的人，必須首先發展自己的文化。要使自己的文化發展起來，就必須廣泛收集古今中外博學之士的文類書籍，把它們譯成各自的語言文字。這樣才能做好發展文化的橋樑」。[19] 在當時的社會文化背景下，蒙文學會確實發揮了「發展文化橋樑」的作用。

察哈爾蒙古圖書編譯館創立於1935年，創業兩年後於1937年關閉。察哈爾蒙文圖書編譯室是官方投資的文化機構。在短短兩年的時間內，該編譯室編輯出版了蒙文注解「孝經」、蒙漢合璧聖人教誨錄、蒙漢合璧「大學」讀本、今古奇觀、蒙語語法、元朝秘史等有影響力的圖書。察哈爾蒙文圖書編譯室是以「服務於蒙古地區文化教育需要為宗旨」的，不以營利為目的的公益性文化機構。[20]

首席官府印刷所於20世紀40年代初創立於張家口。首席官府印刷所設有研究室和印刷所兩個機構。截止1945年該印刷所編輯出版了修辭學、蒙語語法、蒙語詞典、正音法、青史演義、黃金家族史略、蒙古歷史、大聖成吉思汗兵法、地球和人類的起源、商務教科書、大漠故鄉等圖書。著名文化學者、當代蒙古族文學奠基人納·賽音朝克圖（賽興嘎）曾在首席官府印刷所任職，並參與了滿都胡蒙古雜誌的編輯工作。

1918年到1945年間，上述蒙古族文化出版機構以「傳播知識文化、開明大眾智慧、振興民族文化」為宗旨，共編輯出版了200餘種圖書、10餘套教科書和近15種類的期刊雜誌。在當時蒙古地區社會動盪、經濟蕭條、文化落後的特殊環境下，蒙古族「文化啟蒙者們」為了實現他們的文化理想，為了使落後愚昧的蒙古大眾的覺醒，能夠貢獻出這麼多的「精神食糧」確實是一件不容易的事情。當時的蒙古族出版業深受時政動亂、戰爭頻繁、財力困難的制約，真可謂是命運多舛，難保發展。以當時蒙古文期刊的命運為例就能夠很好的說明這一點。由於上述原因，當時很多蒙古文期刊僅出刊3、4期，甚至1、2期就不得不停刊。例如，由首席官府印刷所編印的新蒙古雜誌，從1941年9月創刊到1944年9月停刊期間只出刊了四期。滿都胡蒙古雜誌於1945年4月創刊，到1945年8月就停刊，只印刷了兩期。正當該刊第二期印刷之時，恰逢蘇蒙聯軍的總攻開始，滿都胡蒙古的第二期還沒裝訂完就被拋棄在裝訂車間裡。在民國時期創辦的蒙古文期刊裡，由蒙文學會主辦的丙寅雜誌存在的時間最長。該雜誌於1927年創刊到1944年停刊，共出刊十期。但由於種種原因丙寅雜誌的第1至3期和第7、8期均已失傳，給蒙古族讀者留下了無限的遺憾，給蒙古族文化

史造成了無法挽救的損失。由於丟失情況嚴重，現在已無法考證這個時期所出版某些期刊的創刊和停刊年代。但這些困難沒能阻擋當時蒙古族出版家探索的腳步。他們迎難而上，為實現「文化救民族」的人生信念而夜以繼日的艱苦奮鬥，直到理想實現。

四、新型民營出版機構

民國時期蒙古族出版機構的誕生，受到當時啟蒙思潮影響的同時，也受到內地近代新型民營出版企業經營模式的啟發。民營出版是一個傳統的出版形式。但新型民營出版業是近代出版領域的新生事物。新型民營出版業最初發源於外國傳教士的出版活動，於19世紀70年代逐漸登上歷史舞台。1876年英商美查創辦點石齋石印書局。「1882年，點石齋石印書局印製的康熙字典在很短時間內便發行了十餘萬冊，獲得了相當豐厚的利潤」。[21] 1882年徐鴻複、徐潤開設了中國人自己集資創辦的第一家石印書局——同文書局。「同文書局於開創初期備有石印機12架，雇傭工人500名，專門用石印法翻印古籍，著名的有影印殿版二十四史、康熙字典、佩文齋書畫譜等」。[22] 從19世紀90年代開始商務印書館在上海崛起，取代點石齋和同文書局成為全國民營出版業的領頭雁。「自商務印書館創立後，我國的私營出版企業發展很快。據記載，從戊戌變法到1902年，僅上海一地，加入上海書業商會的私營出版機構就有22家」。[23] 這足以證明當時新型民營出版事業的興旺發達。

新型民營出版業具有私有性和商業性。民營出版業的崛起，在出版史上的意義是巨大的。首先，「在清末新政時期出版主體多元化格局下民營出版主導地位的正式確立，並被最終定格下來，延續到了整個民國時期。這種宏觀出版格局的新一輪佈局，也意味著出版生產關係的新一輪調整，出版活力借助於民間文化力量的參與和民間資本的運作，得到了很大程度的釋放」。[24] 再者，「清末的民營出版活動，不僅催生了近代一種新的實業，而且它本身即是時代政治、文化潮流的感應器。在民族矛盾日益加深，政治鬥爭日益複雜的形勢下，各種政治力量以及關心民生的人士，都紛紛拿起出版作為武器。或為救亡呼籲，或為啟蒙吶喊，或為政治諫言，或為民生請命。不同的出版目的和追求，演繹了近代出版文化的多彩多姿。出版人在中國思想文化的變局之中，又影響國民生活的知識獲取、文化休閒和思想改變等方方面面，而成為近代文化事業中不可或缺的重要組成部分」。[25]

20世紀初，當現代蒙古族出版業在蒙古族文化的沃土裡剛剛誕生時，內地新型民營出版業已迎來了其鼎盛時期。無可非議，內地新型民營出版業的先進經營方式為民國時期蒙古族出版文化提供了可供參考的模式，並促進了其誕生和發展。1918年1月12日，蒙漢翻譯國光書社在張家口成立，揭開了民國時

期蒙古族出版業的帷幕。該書社創業之初，由29人入股籌集資金近一萬元，其性質為私人集資的民營企業。蒙文學會的創立晚於蒙漢翻譯國光書社近10年。1927年，當蒙文學會在北京創立時，同樣也借鑒了內地民營出版業的管理經驗，尤其是商務印書館的經營模式。1919年蒙文學會的創立人布和克什克在朝陽中學學習的同時，也「就讀了商務印書館英語函授班」。[26] 布和克什克與商務印書館的接觸以及對商務印書館經營模式的了解，對後來蒙文學會的經營和管理起到了潛移默化的作用。蒙文學會創立時也和蒙漢翻譯國光書社一樣，用入股集資的方式解決了學會的經費問題。蒙文學會借鑒了內地民營出版業的管理模式成立了董事會。董事會由大會選舉產生，董事會對每個會員的工作進行監督，定時公佈每個會員的工作報告並有權免去未完成工作任務會員的職務。董事會通過董事大會規章制度，並按規章制度處理日常工作。這些工作秩序和經營模式表明當時蒙古出版業的管理已經達到了比較成熟的程度。

民國時期蒙古族的出版業是整個中國出版業的組成部分之一。所以，其形成和發展必然受到內地出版業這個大環境的影響。但是，民國時期蒙古族出版業未能實現出版物的商品化，也未能增值收入提高經濟效益。究其原因，一方面是因為當時的社會不穩定、經濟不發達、教育不普及以及交通不便利等客觀條件制約了蒙文讀者市場的形成，另一方面是因為當時的文化人興辦學校、出版社和圖書館不是為了營利，而是為了通過文化活動啟蒙蒙古大眾。客觀和主觀條件決定了當時的蒙古族出版業雖按著民營模式運行，最終卻未能走向商品化而走向公益化的既矛盾又統一的道路。傳播知識文化、開明大眾智慧、振興民族和國家是當時蒙古族出版家的最高文化理想。為了「開民智」色冷冬日布創立了蒙漢翻譯國光書社；以結束「守舊棄學」的陋氣，普及「民族教育」為目的特睦格圖創辦了北京蒙文書社；樹立「喚醒民族、振興文化、效力政治」的理念，克興額在奉天主持了東蒙書局。雖然，這些「書社」、「書局」、「學會」存在的時間不長，但它們為後人留給了值得繼承的出版經驗和文化精神。

五、結　論

蒙古族出版業始於13世紀。長期以來，官方出版、寺院印刷、私人刻書一直是蒙古族出版的組織形式。到民國時期蒙古族出版業這種「三足鼎立」格局被日益興起的蒙古族新型出版業所替代。啟蒙思想的傳播、蒙古族知識份子群體的形成、蒙文活鉛字的發明促進了民國時期蒙古族出版現代化的進程。

1918年在張家口蒙漢翻譯國光書社「安家立業」，開啟了民國時期蒙古族出版歷史。1918年到1945年，民國時期蒙古族出版只存在短短的二十七年。但民國時期蒙古族出版宛如挑起古代出版和現代出版的一條扁擔，為蒙古族出版文化留下了太多值得回味的東西。發明蒙古文活鉛字、終結宗教出版統治的局

面、大量編輯出版民俗讀物、傳播以「啟蒙」為主題的知識文化……這些在民國時期蒙古族出版活動中誕生的詞語，在某種意義上突顯了其現代化、民俗化的特徵和性質。

經營模式的改變是民國時期蒙古族出版的一大特點。民國時期蒙古族的出版業是整個中國出版業的組成部分之一。所以，他的形成和發展必然受到內地出版業這個大環境的影響。20世紀初，當現代蒙古族出版業在蒙古族文化的沃土裡剛剛誕生時，內地新型民營出版業已迎來了其鼎盛時期。無可非議，內地新型民營出版業的先進經營方式為民國時期蒙古族出版文化提供了可供參考的模式，並促進了其誕生和發展。由於當時的社會不穩定、經濟不發達、教育不普及、蒙文讀者市場未形成等客觀條件制約了蒙古族出版的商品化。但從經營機制中我們不難看出通過「自籌資金」、「自主經營」、「自我發展」來實現其經營管理的努力。另外，因為當時的文化人興辦學校、出版社和圖書館的主要目的不是營利，而是為了通過文化活動啟蒙蒙古大眾。客觀和主觀條件決定了當時蒙古族出版業雖按著民營模式運行，最終卻未能走向商品化而走向公益化的既矛盾又統一的道路。

民國時期蒙古族出版事業的形成是一批先進知識份子在出版界活躍的結果；是這些覺醒的知識份子為了改變社會落後面貌以出版寄託自己人生信念的結果；是內地啟蒙思想滲透蒙古地區，解構蒙古社會傳統文化內部結構的結果，對蒙古族出版文化所帶來的影響是非常深遠的。

注　釋

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Brief Communication

The Mongolian Publishing Culture under Enlightenment Thought, 1918-1944

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Abstract

Mongolian publishing industry has started in the 13th century, after hundreds years of good efforts, the industry has entered the stage of growth since 19th century. The development of Mongolian publishing had a glorious time in the period of Republican. During 1918 to 1944, more than ten modern Mongolian publishing houses had been well established, in which located at Beijing, Zhangjiakou, Houhe, Fengjing, Xinjing and Kailu. The Mongolian publishing houses in the Republican period were regarded as the products of Mongolian Enlightenment Thought. The appearance of these publishing houses, such as Beijing Mongolian Publishing Company, Eastern Mongolian Publishing Company, Kai Lu Mongolian Association and so on, have destructed the inner construction of Mongolian traditional culture, and brought far-reaching effects on the history of Mongolian culture. There were many excellent publishing houses in the period. They have overcome the severe shortage of money and manpower, collected the rare and antiquarian books, published and edited modern books/magazines, compiled Mongolian textbooks, as well as established many schools, which have made great contributions to the popularization of culture in Mongolian area, the broaden of the modern thought, and the progress of the society.

Keywords: *Enlightenment thought, Mongolian publishing, Publishing culture, Intellectual, Knowledge dissemination*

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JoEMLS 註釋（Notes）暨參考文獻（References）羅馬化英譯說明

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2. 作者（含團體作者）、機構名稱（出版者）、地名（出版地）：依事實與習慣為英譯，如無法查證時，中國大陸地區作者以漢語拼音處理，台灣以威妥瑪拼音（Wade-Giles system）處理。
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5. 本刊文章註釋（Notes）或參考文獻（References）羅馬化英譯規則，仍遵循Chicago（Turabian）或APA之精神及原則，進行必要且相對應之編排處理。**此羅馬化作業屬權宜措施，不可取代原有正式之引文規範。**
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   範例1 －註釋（Notes）
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一、本刊秉持學術規範與同儕評閱精神，舉凡圖書館學、資訊科學與科技、書業與出版研究等，以及符合圖書資訊學應用發展之教學科技與資訊傳播論述。均所歡迎，惟恕不刊登非本人著作之全譯稿。

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